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September/October 1991 $3.75

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CB Action

Managing Editor:
Len Shaw VK3NLS

Production Manager:
Paula Parker

Editorial Office:
603-611 Lt. Lonsdale St.,
Melbourne 3000
Postal — GPO Box 628E,
Melbourne 3001
Phone: (03) 601 4222
Fax: (03) 670 9096

CONTRIBUTORS

Russell Bryant
P.O. Box R16,
Roselands, NSW 2196

David Flynn
P.O. Box E160,
St. James, NSW 2000

Rod Fewster
P.O. Box 29,
Kallangur, Q 4503

Greg Towells
P.O. Box 514,
Toukley, NSW 2263

Rob Williams
P.O. Box 108,
Minto,
NSW 2566

Ken Reynolds
1290 Nepean Highway,
Cheltenham, Vic 3192

Bob Bell
P.O. Box 301,
Chester Hill,
NSW 2162

Patrick McDonald
P.O. Box 357,
Round Corner, NSW 2158

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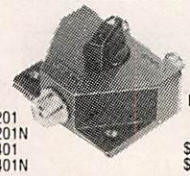

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ON CHANNEL

VESTED INTEREST - NO WAY! During the recent reader survey we received a couple (that's two only) letters suggesting that most of our regular contributors are involved in the CB industry and, in consequence, have a vested interest in the products they write about and/or test. Because of this belief, the authors of the letters felt that the magazine loses credibility and, if their belief was correct, we would certainly agree.

They are, however, almost 100% wrong.

Without putting professions/trades against specific names our contributors have the following occupations...policeman, TV public relations, ex RAAF member, travel writer, clerk of courts, journalist, cartage contractor and bank officer...hardly a vested interest in the CB industry.

Rod Fewster, who writes the Spectrum Anarchy column and has done since the magazine started life back in the mid-70s, is certainly involved in the industry as proprietor of Queensland's South Pacific Radio but rarely does anything other than write the column.

Ken Reynolds is an ex fulltime editor of Amateur Radio Action magazine and currently proprietor of Power Band Communications and is certainly also involved in the CB industry. Yes, if you didn't know Ken he might be considered to have a vested interest when reviewing new transceivers, however, if you have read his reports you'll notice that he rarely gives a 'rave review' and invariably points out poor design and/or performance where necessary.

Now do you really think we would use someone who put a so-called vested interest ahead of a credible report...you've gotta be joking ! Ken's reports are backed up with a technical analysis data sheet and if ever there is any doubt about his comments we have them checked again by a totally non-industry expert before they appear in the magazine.

All our contributors other than Rod and Ken were chosen for their knowledge of a specific subject and this knowledge has been gained through their involvement in what is to them an absorbing hobby...certainly not a business.

TIMES ARE TOUGH We all know that the economy is still a long way from recovery and one of the most recent casualties has been the Captain Communications operation. This company has been a long-time member of the CB industry and had a well earned reputation for its straight-up trading and we're very sorry to see it has now gone down.

What it does do is to make us even more aware of the support our readers should be giving to the advertisers in this magazine. Our advertisers are literally the backbone of hobby radio communications and they deserve your support during tough times. Many of them have been in business since the early days of CB and the fact that they have survived previous economic downturns is a mark of both their business expertise and their commitment to radio communications.

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Leonard J. Shaw
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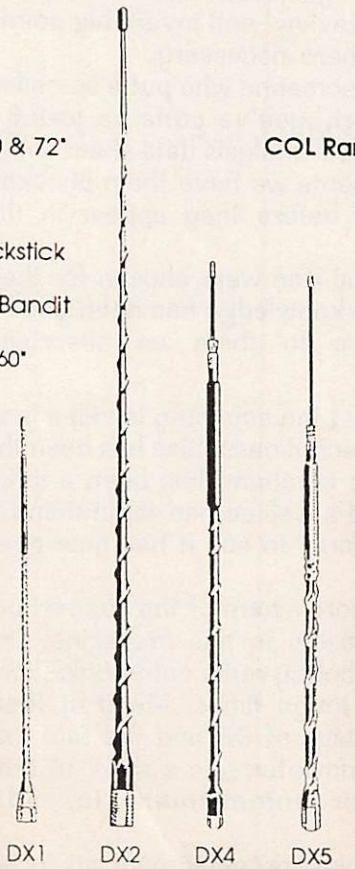

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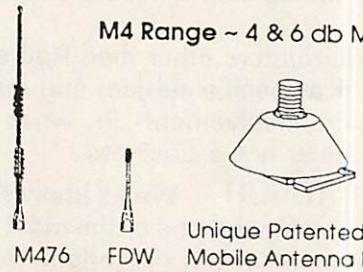

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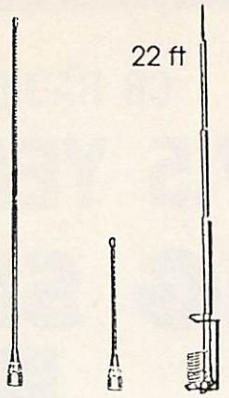

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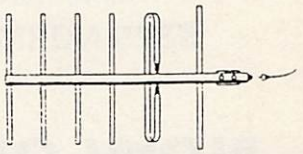

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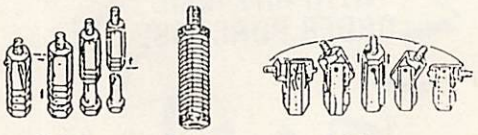

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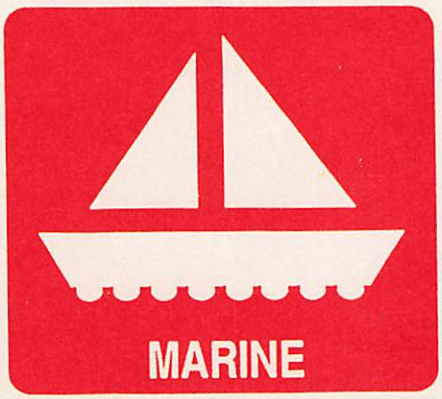

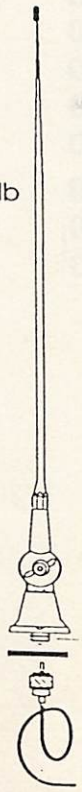

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Newcomers start here

It should be stated right now that there is no special CB language.

Many newcomers believe that they require a lecture on the basics of CB language before they can operate on air. This is simply incorrect.

While some stations use esoteric CB jargon, all Australian CBers understand English and this is all you need to go on air.

A half hour spent listening before going on air for the first time will be time well spent as you will hear how to initiate a contact and how pass the conversation back to the other station and, really, that's about all there is to it.

Even so, while it is not essential that you know and understand some of the various abbreviations used and/or the amateur 'Q' code, it can be helpful to you.

That is what this introduction is all about. One of the first things you will hear is a ***QSO.***

A ***QSO*** *is simply a contact with another station. It derives from the amateur radio operator's* ***'Q' code*** *- a form of abbreviation used by amateurs when sending* ***CW*** *(continuous wave transmission) which is simply another way of saying morse code.*

Morse code *is not used in CB, however, a number of 'Q' code abbreviations are ...*

A ***QSL*** *is a card sent from one station to another confirming that these stations have been in radio contact. It is not sent after every contact, but, is usually exchanged after a DX contact.* ***DX*** *means long distance, usually overseas but often just interstate. If the station to which you are talking asks whether you QSL the operator is asking whether you will send him a QSL card to confirm the contact.*

A ***QTH*** *is the 'Q' code for location so, if you're asked* ***"what's your QTH?",*** *the station is asking where your station is located. It's just as easy to ask in plain English, but, it adds a bit of glamour if you say QTH instead.*

You'll hear many stations talking about ***SWR (usually pronounces swer - which is incorrect - it is SWR spoken as letters) and this stands for*** *Standing* ***W****ave* ***R****atio. This is essentially a measure of the antenna's effectiveness and is read off an* ***SWR meter.*** *You will learn what SWR is from this magazine or from a CB store. When you hear a station calling* ***CQ CQ*** *it means that he is looking for a contact with another station. CQ means* ***'seek you'*** *while CQDX CQDX is different (seek you long distance) in that the station only wants a long distance contact - not a local one.*

AM *stands for amplitude modulation while* ***SSB*** *stands for single sideband. If you have an* ***AM only rig*** *it's nice for everyone if you stay on the lower channels and, conversely, if you are using SSB you should restrict your activity to the upper channels.*

QSB *means that the signal has a tendency to fade - that is, it goes from strong to weak and back to strong again, sometimes over a period of seconds and other times over a period of minutes.*

It is not a fault of the station, but, of atmospheric conditions. If a station says there is QSB on your signal it means that your signal is fading and when this occurs it is best to keep your ***OVER*** *short or you are likely to lose the other station while you're talking.*

SKIP *is essentially the same as DX - if the skip 'is running' it means that there are interstate and/or overseas stations being heard.*

BEAM, YAGI and ARRAY *all mean much the same. They mean that the station is using an antenna system which effectively (and legally) increases the restricted power output of the CB rig and can be pointed at the other station for improved communication.*

A ***ROTATOR*** *is used to turn a beam,* ***Yagi*** *or array. Incidentally,* ***Yagi*** *is spelt with a capital Y as Yagi is the name of the inventor of the beam.*

Welcome to CB Action magazine - the only regular CB publication in Australia and also the oldest, having been first published in 1977.
CB is a form of radio communication which is popular around the world, however, unlike amateur radio, it is not necessary to pass an examination to go on air.
All that is needed is a licence and the equipment.
CB Action, though, is a little more than just CB. While CB is the backbone of the magazine, it also has reports and reviews on scanners, antennas, shortwave radios and other areas of general interest to radio communicators and listeners.
In the course of reading the magazine (and on air) it is probable that newcomers will encounter words which mean nothing to them. This short introduction is to help these readers understand CB terminology and its application.

LINEAR, BOOTS, AFTER-BURNER, LITTLE HELPER, *etc mean that the station is using illegal equipment to increase the power output and will eventually receive a call from DoTac.* ***DoTaC*** *is used in this magazine as an abbreviation for the Department of Transport and Communications - the authority charged with the regulations of CB radio.*

A ***POWER MIKE*** *is an after-market accessory which can also improve your station's 'talk power'. Whether or not they are legal is open to question, but, they probably aren't.*

QRM *is when another station is making it difficult to hear due to being too close to your own station, having a rig in poor condition, running illegal power, etc.* ***QRN,*** *however, is noise made by atmospheric conditions or, more likely, static caused by poorly installed electrical power lines out in the street.*

A ***SWL*** *is a Short Wave Listener but an* ***XYL*** *is usually the wife - an ex-young lady.* ***YL*** *is of course young lady and a* ***DOUBLE BUBBLE*** *is a police vehicle.* ***GOOD BUDDY*** *is a somewhat derogatory term applied to operators who still use American style CB jargon such as, "what's your 10-20?" or "that's a big 10-4".*

This ***10 code*** *originated in America, but, is now rarely used as it indicates that the operator has what can be best termed a 'juvenile brain'.*

A ***BREAKER*** *is an operator who wants to get into an existing conversation and there's nothing wrong with* ***BREAKING*** *providing that you only call in the pause between overs.*

If you break between overs one of the stations will probably say ***ACKNOWLEDGE THE BREAKER*** *which means that you have been heard and will be invited to join in when the stations are ready - in other words standby and don't keep shouting.*

An ***ALLIGATOR*** *is another derogatory name which is applied to an operator who talks too much but doesn't listen - in short, all mouth and no ears.* ***SANDBAGGING*** *means to listen to a conversation but not join in yourself.*

A ***DUMMY LOAD*** *is a device which should be used when testing or tuning your rig. It can be purchased from any CB store and should be a must in your list of station equipment.*

UHF *stands for* ***U****ltra* ***H****igh* ***F****requency and is the 477 MHz CB service.*

LONGPATH *means that you are pointing away from a station you are speaking with rather than* ***SHORTPATH*** *which of course means the opposite.*

Different atmospheric conditions mean that at certain times you can communicate with (usually overseas) stations by sending your signal right around the world rather than by the most direct path. An operator who works out of the legal channel frequencies or runs illegal equipment is referred to as a ***PIRATE.***

An ***ATU*** *stands fro an* ***A****ntenna* ***T****uning* ***U****nit which is used to tune your antenna to a good match with your rig if the SWR is a little too high.*

It won't cure any major SWR problems, but, it can adjust a slightly high SWR reading to a 1:1 match with the transceiver. If you receive a visit from the ***RIs*** *you're probably in trouble for causing* ***TVI*** *-* ***T****elevision* ***I****nterference - or -* ***BCI*** *-* ***B****roadcast* ***I****nterference. RI stands for* ***Radio Inspector*** *- the gentlemen from DoTaC who call around if there are any complaints about your station. RIs are also often called* ***RED INDIANS.*** ***COAX*** *stands for coaxial cable, the link between your rig and the antenna while a* ***WHIP*** *is not something wielded by a leather-clad lady but is rather a generic tern for mobile antennae.*

A ***REPEATER*** *relays a UHF CB signal from one point to another so giving much greater range of communication and a repeater list is published in every second issue of this magazine. After all of the above we reiterate - it is not necessary to learn CB jargon to go on air. Sure it helps, but, it will all come in time - for now though just use commonsense English and if you don't understand something don't be afraid to ask - remember everyone you hear also had a first time on air.*

We hope you enjoy CB and CB Action.

scan

by Russell Bryant

FREQUENCIES, CODES and EVERYTHING ELSE YOU WANT TO KNOW ABOUT SCANNING

All frequencies are FM and all times are local,unless stated otherwise.

IN THE BEGINNING
(Part three)

We know that a group of fish is called a school, further, a collection of birds is a flight. So what is a mass of scanner antennas known as...confusing that's what...especially when trying to determine which one is best suited to your needs. In this issue we look at the models available along with a rundown on price and performance.
There are scanner antennas to suit every application and price, in fact the consumer is inundated with aerials specifically manufactured for scanners. The price tags attached to these sky sticks vary from a humble $20.00 to over 10 times that amount. The purchase of a scanner is your passport to the world of two-way radio. Hundreds and thousands of radio waves crisscross the atmosphere daily and the of a scanner with an on-board whip allows the enthusiast to monitor those waves in his or her corner of the world. However, at some stage most hobbyists look beyond their immediate situation and decide to extend their listening horizons.

MOST COMMON SCANNING ANTENNA IS THE DISCONE

Without argument, the most common scanner antenna is the discone. They claim to have broadband receiving capabilities from the HF band into the microwave portion. While it is true that discones do have a broad frequency response and will receive signals well into the UHF frequencies, performance deteriorates dramatically at either end of the scale, so exercise some care when purchasing one.
Most discones exhibit a modest amount of gain over the standard quarterwave, however, there are frequencies at which the anetenna will appear to be "deaf". They can in fact attenuate a signal. They also present a problem when mounting as the average antenna stands between a metre to a metre and a half tall and nearly a metre across. They require plenty of room to erect and are not suited to flat dwellers.

COLINEAR ANTENNA MIGHT BE BETTER

A colinear scanning antenna may be a better choice if space is a problem. Resembling a base type two-way antenna, the colinear is a neat package with an overall length of about 1.5 metres. Performance of the colinear is approximately that of a quarter wave at frequencies between 70-500 MHz. The Mobile One colinear is fitted with three and a half metres of cable, terminated with a Motorola plug. At around $50, it is a relatively cheap and easy way to improve reception on your scanner.
If money is no object the active antenna provides a compact, wideband omni-directional antenna capable of installation indoors and out. Radio frequency amplifiers are employed in active antennae, boosting the in-coming signal to an acceptable level. If you are unable to erect an outside antenna an active may be the answer. As with any amplifier, overloading can be a problem. Scanners are no exception to the rule and in heavy RF areas the front end can be swamped with too much signal which results in inter-modulation or cross modulation.

MAYBE A LOG PERIODIC

One receiving antenna often overlooked by hobbyists is the log periodic. This type of antenna display broadband characteristics, high levels of gain, plus directional capabilities. For example...you wish to monitor a particular channel or frequency some distance away and the signal coming in on the omni-directional antenna is scratchy and broken. A log periodic antenna can improve reception, sometimes to the point where previously unheard stations are booming in.
A log delivers the strongest signal to the radio from the front of the antenna and this is termed the frontal receiving lobe. When compared to the back and side lobes the frontal lobe can be ten times the size. Signals outside the frontal lobe are normally below strength, in some cases so low that the receiver will reject them.
Having briefly described the types of scanner antennas available, I have catalogued a list of the various models, their features, price and availability. Prices quoted are an indicator only as the fluctuating fortunes of our dollar makes it difficult to put a firm price on these products.

BRAND:	*MALDOL*
MODEL:	HS 1300B
TYPE:	Active base antenna
FREQUENCY:	20-1300 MHz
FEATURES:	15dB gain 3dB
DISTRIBUTOR:	Imark Australia 03 329 5433
REC.RETAIL:	$208.50

BRAND:	*MALDOL*
MODEL:	HS 1300M
TYPE:	Active mobile antenna
FREQUENCY:	20-1300 MHz
FEATURES:	15dB gain 3 dB
DISTRIBUTOR:	Imark Australia 03 329 5433
REC.RETAIL:	$150 (approx)

BRAND:	*COMET*
MODEL:	CDS 150
TYPE:	Discone base antenna
FREQUENCY:	25-1300 MHz
FEATURES:	3dB gain, transmit 50, 145, 435, 900 & 1200 MHz
DISTRIBUTOR:	Imark Australia 03 329 5433
REC.RETAIL:	$180.00

BRAND:	*COMET*
MODEL:	CDS 180
TYPE:	Discone base antenna
FREQUENCY:	25-1300 MHz
FEATURES:	3dB gain, transmit 28, 50, 145, 435, 900 & 1200 MHz
DISTRIBUTOR:	Imark Australia 03 329 5433
REC.RETAIL:	$217.50

BRAND:	*HOXIN*
MODEL:	Scan X
TYPE:	Discone base antenna
FREQUENCY:	70-500 MHz
FEATURES:	Basic antenna with little gain
DISTRIBUTOR:	Imark Australia 03 329 5433
REC.RETAIL:	$90.00

BRAND:	*DIAMOND*
MODEL:	D 130
TYPE:	Discone base antenna
FREQUENCY:	25-1300
FEATURES:	Loaded vertical top element for lowband VHF monitoring transmit 50, 144, 435, 900 & 1200 MHz
DISTRIBUTOR:	Access Communications 02 4175311
REC.RETAIL:	$199.00

BRAND:	*DIAMOND*
MODEL:	D 707E
TYPE:	Active base antenna
FREQUENCY:	500 kHz-1500 MHz
FEATURES:	20 dB gain, variable to 0 dB
DISTRIBUTOR:	Andrews Communications 02 349 5792
REC.RETAIL:	$229.00

BRAND:	*DIAMOND*
MODEL:	D 505
TYPE:	Active mobile antenna
FREQUENCY:	500 kHz-1500 MHz
FEATURES:	20 dB gain, variable to 0 dB
DISTRIBUTOR:	Andrews Communications 02 349 5792
REC.RETAIL:	$179.00

BRAND: *SPR (SOUTH PACIFIC RADIO)*
MODEL: Scantenna XLR
TYPE: Discone base antenna
FREQUENCY: 25-1300 MHz
FEATURES: Vertical top element for lowband VHF.
DISTRIBUTOR: South Pacific Radio 07 204 5000
REC.RETAIL: $145.00

BRAND: *REALISTIC*
MODEL: Catalogue No. 20-013
TYPE: Discone base antenna
FREQUENCY: 25-1300 MHz
FEATURES: Transmsit 144, 220, 440 & 1296 MHz
DISTRIBUTOR: Tandy Stores.
REC.RETAIL: $129.95

BRAND: *MOBILE ONE*
MODEL: Catalogue No. D-4432
TYPE: Dipole base antenna
FREQUENCY: 70-500 MHz
FEATURES: Low profile, comes with 3.5 metres of cable.
DISTRIBUTOR: Dick Smith Electronic Stores.
REC.RETAIL: $49.95

BRAND: *ICOM*
MODEL: AH 7000
TYPE: Discone base antenna
FREQUENCY: 25-1300 MHz
FEATURES: Loaded vertical top element for lowband VHF, transmit 50, 144, 435, 900 & 1200 MHz
DISTRIBUTOR: Icom Australia 008 338 915 or 03 529 7582
REC.RETAIL: $270.00 (approx)

BRAND: *ATN ANTENNAS*
MODEL: 9 element
TYPE: Log periodic
FREQUENCY: 100-500 MHz
FEATURES: High gain directional, vertical or horizontal polarisation
DISTRIBUTOR: ATN Antennas 054 922224
REC.RETAIL: $259.00

BRAND: *ATN ANTENNAS*
MODEL: 13 elements
TYPE: Log periodic
FREQUENCY: 65-520 MHz
FEATURES: High gain directional, vertical or horizontal polarisation
DISTRIBUTOR: ATN Antennas 054 922224
REC.RETAIL: $299.00

BRAND: *ATN ANTENNAS*
MODEL: 15 elements
TYPE: Log periodic
FREQUENCY: 50-520 MHz
FEATURES: High gain directional, vertical or horizontal polarisation
DISTRIBUTOR: ATN Antennas 054 922224
REC.RETAIL: $339.00

BRAND: *ATN ANTENNAS*
MODEL: 19 elements
TYPE: Log periodic
FREQUENCY: 50-800 MHz
FEATURES: High gain directional, vertical or horizontal polarisation
DISTRIBUTOR: ATN Antennas 054 922224
REC.RETAIL: $369.00

BRAND: *ATN ANTENNAS*
MODEL: 23 elements
TYPE: Log periodic
FREQUENCY: 50-1000 MHz
FEATURES: High gain directional, vertical or horizontal polarisation
DISTRIBUTOR: ATN Antennas 054 922224
REC.RETAIL: $399.00

(continued over page...)

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★ DM-451 ROGER BEEP MIC, $69 ★ DM-452 ECHO PWR MIC, $79

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(nr Great Western Hwy)
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(03) 720 5900 or 720 5280
6 Church St, BAYSWATER
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FAX (03) 720 5280 man

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Shop 3, 450 Logan Rd,
STONES CORNER BRIS. 4120
BANKCARD — MASTERCARD — VISA
FAX (07) 397 7269 man

scan

by Russell Bryant

CONTINUED FROM PRIOR PAGE.....

BRAND:	***ATN Antennas***
MODEL:	**25 elements**
TYPE:	**Log periodic**
FREQUENCY:	**50-1300 MHz**
FEATURES:	**High gain directional, vertical or horizontal polarisation**
DISTRIBUTOR:	**ATN Antennas 054 922224**
REC.RETAIL:	**$429.00**

BE VERY CAREFUL

Before proceeding any further I must comment on a few safety rules that MUST be followed when erecting an external antennae. The most obvious danger encountered is height. In an attempt to gain maximum altitude you should never extend yourself beyond the safe limits of the ladder or roof top. It doesn't take much to over-balance and come crashing down to earth.

It almost goes without saying that the human body is a an excellent conductor of electricity. What must said is that the electricity flowing in domestic circuits is commonly quoted at 240VAC. It may surprise you to know that alternating current reaches peaks of 678 volts. In other words **ELECTRICITY KILLS**, especially when aluminium discones or the like drop across the wires when you're holding onto one.

Whenever possible always have assistance when putting up your external antenna, if only to fetch a drink or tools that may be required from time to time. Lastly, if in doubt DON'T. That little extra is not worth your life.

Although any of the antennas listed above can be used on a handheld scanner while in a base situation, they are obviously impractical if the handheld is used out and about.

Much has been written praising the virtues of the 477 MHz UHF Citizens Band. It is one megahertz of RF spectrum that has gained universal acceptance with a wide sector of the community. The popularity of UHF CB has given rise to a lucrative after-sales market industry in which specialized antennas make up the greatest percentage.

SUPPLIED ANTENNA IS A COMPROMISE

The point of all this is to answer one of the must often asked questions. Will an antenna tuned to a specific band improve reception? In short, the answer is yes. Handheld scanners have improved the mobility of enthusiasts, second to no other piece of equipment...with one drawback. The supplied antenna is rarely the optimum available and, given the wide frequency response of the average portable, the supplied antenna is almost always very much a compromise.

Many portable scanner users' monitor a single band such as UHF police, VHF aircraft, UHF aircraft or VHF marine. It is in circumstances like these that a commercially made antenna, specifically tuned to the preferred band, will improve reception over and above the broadband whip supplied with the scanner.

For example, if your monitoring activities concentrate on the police UHF band, a stubby, quarter wave or high gain whip primarily manufactured for UHF CB can improve performance over and above the scanner's supplied rubber duckie.

The stubby is a unity-gain antenna, approximately 5 cms in length. It comes into its own when the scanner is carried upon the person as it saves having 15-20 cms of whip protruding up your jumper or out of the pocket. The quarter wave and high gain antennas have a wide following amonge CBers, particularly the high gain types.

Two manufacturers with UHF CB antennas included in their catalogue are;

Mobile One, P.O. Box 166, Picton 2571, telephone 02 603 5000 and API Imports, PO, Crossroads 2170, telephone 02 829 1555.

MAILBAG

LOWBAND MONITORING

Jason, Prospect Vale, TAS, has been tuning into some interesting communications emanating Stateside (America that is..). On 33.900 MHz is the Hamilton County Paramedical Service, which appears to be an ambulance organisation. On and around 35.500 MHz are a number of paging services with messages similar to, "Wayne it's Simon. Bring the Porsche home, I'm lonely without it." Jason would appreciate assistance in identifying the frequencies used by the Federal Airport Corp at Launceston airport.

UHF DX

Alan, Dungog, NSW, has logged some extraordinary communications, also from the USA. On 261.4 MHz AM he monitored Las Vegas Flight Service. While 261.4 MHz is a RAAF frequency locally, it is also a satellite down link and more than likely a satellite is repeating the domestic aircraft transmissions several thousand kilometres. Tune in and let me know the results.

SATELLITE COMMS

Shane of Bendigo VIC, wonders what type of antenna is needed to track the US Navy Fleet Satellite Communications System. I personally use a Diamond D 707E active antenna, however, a number of friends, one in Melbourne the other in the southern Sydney suburbs, use Tandy discones. Some hobbyists have constructed beams and log periodics in an effort to copy the bird...without success I might add. While on the subject of FLTSATCOM, 261.45, 261.525 and 261.7 have been particularly active during recent times.

BATTERY DISCHARGER

In a past issue I detailed a simple ni-cad battery discharger, basically a battery holder and .5 ohm resistor. A reader in Rutherford NSW asks about other 1.5 volts batteries such as C, D and AAA as well as 9 volt cells. For the 1.5 volt batteries the same value resistor is needed. As to the 9 volt, eight .5 ohm resistors in series will do the job. Why do I plug Tandy gear? Tandy are one of only a few companies that can be bothered to support the editorial content of the magazine. That's why!

ALPHABET SOUP

Andrew of Perth in WA is confused by terms like AM, FM, SSB, USB and LSB. Without going into too much technical detail, they are all methods of depositing information onto a radio carrier. Frequencies below 30 MHz are generally AM (amplitude modulation), LSB (lower sideband) or USB (upper sideband). The term SSB (single sideband) relates to sideband transmissions in general. FM (frequency modulation) is the most common mode found above 30 MHz. It is superior for communications because of its lack of noise and susceptibility to atmospheric interference.

POLICE FREQUENCIES

David, Bathurst NSW, wonders why the NSW Police have two different frequency allocations. In fact the NSW Police operate four separate radio networks. The first is their HF system where the main frequencies are 4560, 6905 and 7660 kHz USB. Seventeen frequencies between 83.760-84.000 MHz are used in country NSW except in the South Coast District and Victoria border area. Police stations along the Victoria border can be found on 167/168 MHz for communications with VICPOL. In Sydney and the South Coast District, 64 UHF frequencies between 467.850 and 469.425 MHz are employed. In major country towns channels from the 64 police channels are used as links and crossband channels. It does away with the need for Sydney cars that visit country centres to have cars fitted with two radios (one VHF and one UHF). The Fire Brigade article appeared in the Jan/Feb '90 issue.

BENDIGO CHANNELS

Anthony, Eaglehawk VIC, has logged the following frequencies in the Bendigo area.

Ambulance 76.010, 76.670, 76.910
CFA Bendigo City 163.330
Bendigo Rural 162.970
Conservation and Environment 71.330
Bendigo City Council 80.820 and Armaguard 493.550 MHz.

WHO'S WHO'S AT VKG

David, Penshurst NSW, would like to know the functions of the SOO (Senior Operations Officer) and DOI (Duty Officer Inspector) at VKG Sydney. The SOO is normally a sergeant and he is responsible for the supervision of the radio operators within the operations centre. The DOI assumes overall responsibility for call-outs of specialist staff as well as executive decisions where serious crimes have been committed. Your unknown callsigns are;

Rockdale 64=Patrol Beats
Mike 24=Special Operations Group
Cronulla 165 and Kingsgrove 170=Anti Theft Squad
Alpha 380=Accident Investigation
Ultimo 640=Transit Police

QLD FREQUENCIES

Greg, Springwood QLD, faxed a detailed list of police and other government channels to SCAN. Some of these are;
The QLD Corrective Services 464.425 and 464.825 (for use in and out of prisons)
For police monitors;
467.900=Brisbane Inquiries
468.100=Southside, 468.150=Northside
468.200=Sunshine Coast, 468.225=Special Events
468.425=Brisbane Foot Patrols, 468.725=Beenleigh
468.850=Radar, 469.200 Highway Patrol South
469.225=Highway Patrol North
469.425=Special Operations
Department of Harbors and Marine 450.075, 450.200, 463.100, 490.675, 490.975, 491.275.

SECURITY FREQS UPDATE

Bob Lopaka's in-depth article on security companies has generated a good deal of mail. While Bob is wading his way through the correspondence, he passed one letter onto me for immediate attention. The Newcastle and District Scanner Hobbyists Group noted a few mistakes with the frequencies contained in Bob's article. Security companies currently operating in the Newcastle/Hunter Valley area are;
Muswellbrook Security 74.180,
Lakes Security 76.115,
Gold Security 78.655,
Websters Security 157.855,
EME Security 160.585,
SNP 170.175,
Newcastle Technical College Security 465.850,
Newcastle University Security 486.950,
Wormald Security Newcastle 491.850,
Wormald Security Gosford 491.875,
Wormald Security Hunter Valley 492.475,
Scientific Electronic Alarms 492.275,
Armaguard 493.550,
MSS Security 493.775,
Chubb Security 519.825 (simplex),
Nelson Bay Security 519.850 (simplex).

SEACAT CHANNELS

John of East Gippsland VIC, uses a Powerband Electronics M476 colinear connected to a Tandy PRO 2022. He states the results as being "spectacular". In the meantime he wonders if anyone knows the frequencies used by the Tasmanian Seacats?

HARMONIC PHONE CALLS

Arthur, Georges Hall NSW, poses an interesting question. While tuning into the VHF airband his scanner locked onto what appeared to be a telephone conversation on 121.100 MHz. In fact, he was listening to the fourth harmonic of the cordless telephone frequency 30.275. His question, "is it still illegal to listen even though it is not the correct frequency? Indeed it is, the legislation relating to the Interception of Telecommunications makes it an offence to monitor telephonic transmission by what ever means. Good try but bad luck!

TASMANIAN MEDIA FREQS

Colin, West Tamar TAS, checks in with some frequencies from the Tamar Valley area of the Apple Isle.
Telecom technicians can be heard on 80.280.
Radio 7LA Launceston 162.640
Redline Tourist Coaches 159.640 in Launceston or 161.395 state wide
Georgetown and Beaconsfield Council 77.150.
Southern Cross Network have the following frequencies; 164.920, 164.965, 165.820 and 165.865 MHz.
Radio 7EX has 169.990 for outside comms.
The Examiner newspaper in Launceston is licenced for 158.200.
Finally "aunty" ABC has a number of frequencies;
159.700 ABC TV Hobart,
164.275, 164.500 ABC radio Hobart,
171.780 and 171.900 ABC TV,
461.925 ABC TV studio portables and 474.275,
474.575 for cross banding with 171.780 and 171.900.
While on the subject of media frequencies, much of the activity normally associated with media radio has been taken over by the cellular telephone. In the past reporters would file their stories via the two way radio, now it is the mobile phone. In Sydney a number of radio stations have relinquished their radio systems in favor of the cell phone.

NORTH COAST CHANNELS

Roberta, Bungwahl NSW, has logged the following frequencies for the mid north coast of NSW.
Grafton ambulance 77.625, Forestry Commission 73.025 Kendall, Taree Shire Council link 451.275, Council proper 77.180,
Grafton police crossband 469.375,
National Parks and Wildlife Service around Bulahdelah 73.550 and around Port Macquarie 73.160.

MORE FROM PNG

As promised in the last column, here are the details on the Papua New Guinea Constabulary as supplied by "The Traveller". Channel 1 is 74.310 with channel 3 being 74.640 MHz. Callsigns are made up of Station location, followed by a unit number. For example, Gerehu 2 or Boroko 5. Special units use alphanumeric callsigns, such as Mike 1 or Charlie 17.

ALL MANNER OF THINGS

Peter, Warragul VIC, has noted activity on these frequencies...
76.670 ambulance, 40.625 APM log trucks,
467.625 Alpine Search & Rescue, 163.300 CFA,
71.360 Forest and Lands Dept.channel 3,
70.160 Longford Heliports (oil rig shuttle),
71.345 National Parks channel 5,
500.125 Telecom technicians channel 4 and
493.525 City of Warragul.

WA FREQS

Simon of Perth WA complains that not enough WA readers are writing in so he sent some information in the hope of inspiring others in that part of the world. Included are the following;
Perth media channels, 6PR news 172.770,
TVW 7 news 165.450, ABC news 161.230
STW 9 news 169.960.
The US Consulate uses 164.200 around Perth,
RSPCA 463.775 and University of WA Security 466.025. The Royal Auto Club can be monitored on 74.420, 74.450 and 74.480 MHz.

MORE NZ POLICE CHANNELS

In previous issues I have published the New Zealand police VHF allocations. They support, in addition the VHF, two UHF systems. The first is referred to as the 460 MHz band, the other the 490 MHz band. This column will feature the 460 MHz channels, with the 490 MHz band in the next issue.
Channel 1 465.025 simplex,
ch.2 464.675,
ch.3 464.700,
ch.4 464.725,
ch.5 464.750,
ch.6A 465.050 Criminal Investigation,
ch.6B Dog Squad,
ch.6C 465.100 Anti Terrorist Squad/Armed Offenders Squad,
ch.6D 465.125 country cars simplex,
ch.6E 465.150, ch.6F 465.175,
ch.6V 466.9375 Internal Affairs,
ch.7 464.775 Criminal Investigation and
ch.8 464.800.
As they say in the film industry, "that's a wrap!".

Due to work pressures I am unable to provide personal replies at the moment. However, I will clear the backlog of enquiries that I currently have on file. Please keep your contributions coming. The address to write to is;

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Roger "BEEP" MICS **$???**

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Ken Reynolds (Powerband Communications) asks the question...

WHY NOT USE A LONGWIRE ANTENNA ?

Since the introduction of CB radio to Australia some 15 year ago we have seen a myriad of weird and wonderful base antennas germinate and flourish in thousands of gardens right around the country. There have been quarter waves with ground planes, half waves with and without ring things and radials, five eighth waves with you-name-its, and even bent waves with hoops to confuse the issue - in short, the total variety has been mind boggling.

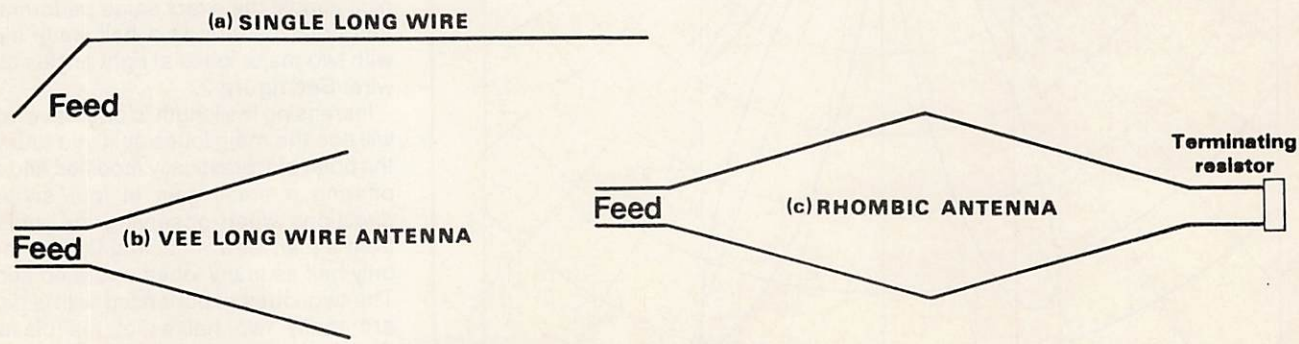
Many have had unrealistic claims to "gain" made for them (particularly during the early days of CB), but, all things considered, most performed quite favorably and the 5/8 types do actually offer a small gain under the right conditions. In the directional antenna category, the most common structure is in the form of a Yagi with an occasional quad element parasitic array thrown in for good measure. Harking back to the "boom" time, there were also a number of top-quality "quads" available but I haven't seen one now for ages (other than home-brewed that is). Most of these devices work well offering modest gain in a directable package. All these antennas, however, are possessed of a couple of built-in disadvantages which few operators tend to recognise in the overall picture of a station. Firstly, they all cost considerable outlay - considerable to those who don't possess a money tree - and secondly, they look like CB antennas which can be a decided deficit from a neighbors point of view - especially if he or she is anti-CB and a bit of a TV freak to boot. The long forgotten long wire type antennas have been around since the discovery of radio propagation and don't suffer from either of the above mentioned afflictions - they do have their limitations but what can one expect for a few dollars worth of copper wire? Most CBers probably haven't even considered using this cheap effective kind of radiator for anything other than an old valve type broadcast receiver - if there are still any kicking around. Old hat though they may be, long wire radiators still have loads going for them with excellent performance being not the least of their features. At the very minimum, they are worth a few hours experimentation and nobody can complain at the price. Let's firstly take a look at the variety of formulations composing a group known as wire antennas.

TYPES OF LONG WIRES

To begin, we have the random length long wire which, as its name implies, can be any length providing it is long ... more precisely, a wire antenna is termed long when it exceeds one full wavelength at its operating frequency. Next in line is the resonant long wire which is cut to approximately any multiple of one wavelength for the operating frequency. This is probably the most common form presently in use. Combining long wires, we arrive at the legendary rhombic and vee configurations which have been employed for many years by professional installations - offering gains up to 40dB in stacked array of immense size. The vee type as its name implies uses two legs arranged in a "V" shape whereas the rhombic is set out in a rhomboid or diamond configuration and terminated with a resistor at the far end. **(see figure 1).** A few years back an amateur operator in Hatherleigh, South Australia had (and may still have) a huge rhombic array

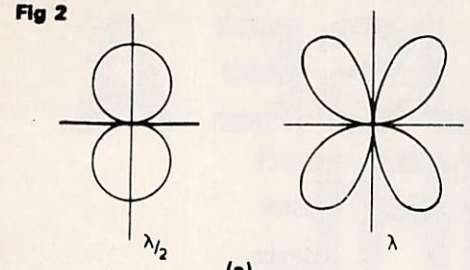
(continued over page...)

Fig 1

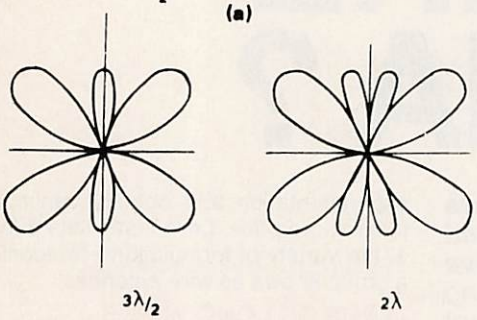


The three basic formats in which long wire antennas are often found.
(a) Resonant or non-resonant single long wire.
(b) The vee antenna consisting of two long wire antennas set out in 'V' formation - the 'V' angle depending on 'leg' length.
(c) The rhombic array. Again two legs arranged in a diamond or rhomboid pattern with the far ends terminated in a resistive load.

Fig 2

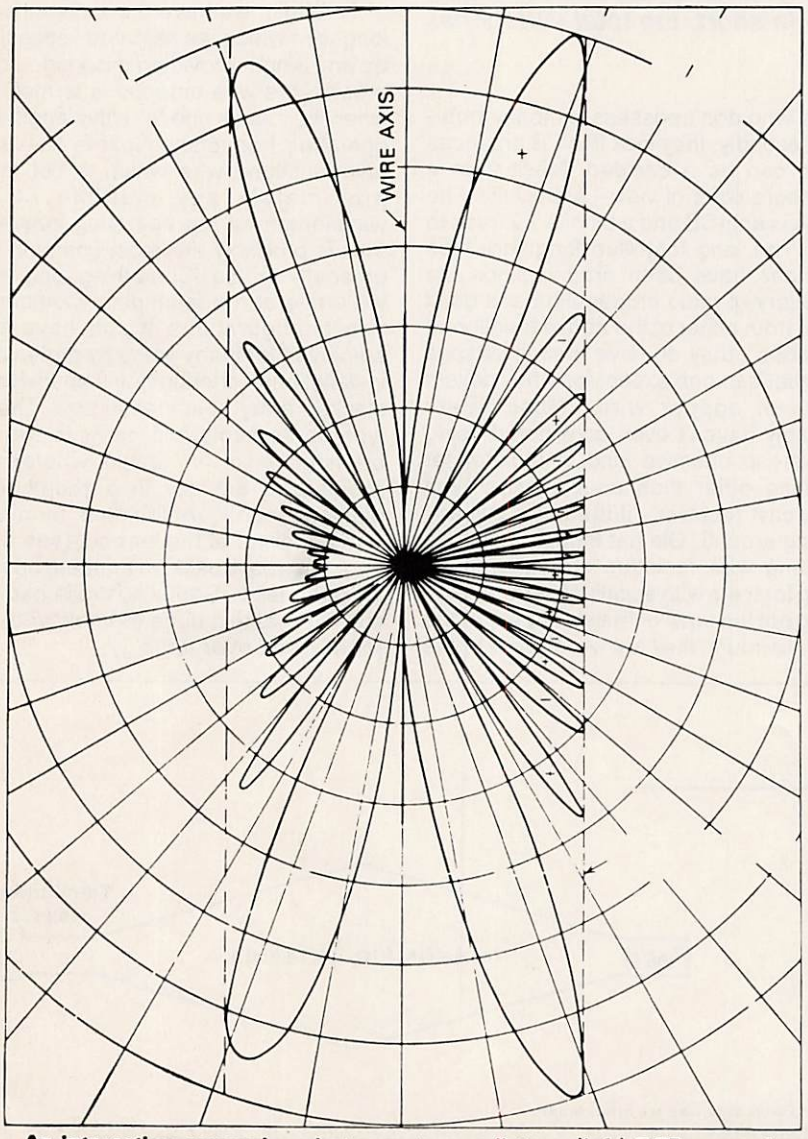


(a)



(b)

Theoretical polar patterns for long wire antennas. Note the increase in lobe numbers and angles as the radiator length increases.
A new lobe for each half wavelength increase.
Note the intensity of minor lobes for both antennas.



An interesting comparison between two radiators, (left) 7.75 waves long and 8 waves (right).

WHY NOT USE A LONGWIRE ANTENNA ?

(continued....)

(continued over page...)measuring 200 metres in length (650 feet) and stacked in four tiers which presents a staggering 35dB gain on the two metre amateur band. With this antenna he is able to listen to solar noise - which requires plenty of gain - or even bounce signals off the moon's curved surface and hear them return some 3 to 4 seconds later. This of course is taking long wires to the extreme but it serves to illustrate the super performance available from such a system if you have the space available. To appreciate the immensity of 35dB gain, imagine your 12 watts PEP CB signal increased to a shattering 45,000 watts effective radiated power and you will have some idea of the potential available. Coming back to earth again, our attempts at such a structure for CB will perhaps not be quite so ambitious, however, they can be very effective all the same.

PROPERTIES OF SINGLE WIRE ANTENNAS

The use of wire antennas has sharply declined over the past few years and, similarly too, has the wide general knowledge of their operation and construction. Since this has now become a little known subject it would require considerably more space than that available here to enter into a full discussion on the theory and practice. There is room however to have a look at the basic principles and a practical example or two.

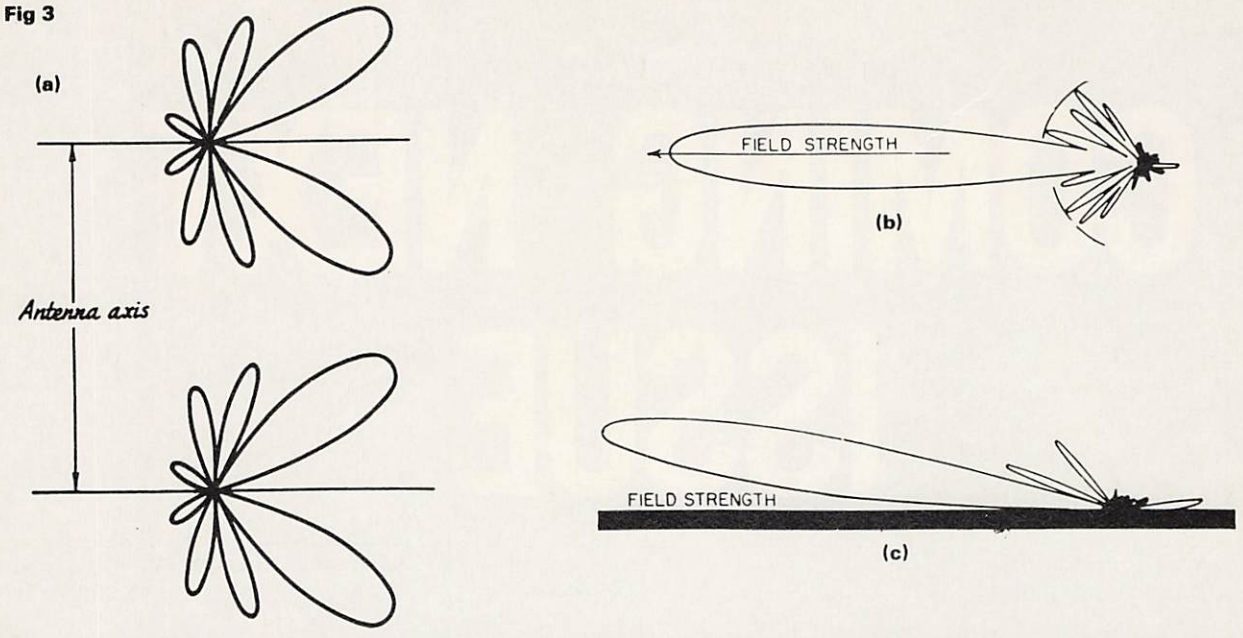
GAIN

The gain of a long wire antenna is strictly dependent on the total length of the wire - not so much in terms of metres but in wavelengths at the operating design frequency. A wire antenna measuring one half wavelength will exhibit almost the exact same performance and polar pattern as a half wave dipole with two major lobes at right angles to the wire. **See figure 2.**

Increasing the length to one wavelength will see the main lobes split into four with the polar plot drastically modified and now offering a small gain in four separate directions when observing the antenna from a plan view. In actual fact there are only half as many lobes as stated above. The two lobes experienced with a dipole are really two halves of the classical doughnut pattern when considering a cross sectional view.

When the doughnut pattern is split down the middle by increasing the radiators length, they in fact become two cone

Fig 3



Combining the two parallel wire patterns in (a) will produce improved results similar that shown in (b) and (c), which is the plot for a similar length rhombic antenna.

shaped lobes of RF energy which actually surround the conductor and fan out in opposite directions from its centre. Only in the cross sectional plan view will they appear as four lobes.

As we increase the length of the conductor a new lobe or cone will appear for each half wavelength increase and this effect will continue so long as the length is increased. With the addition of each extra lobe, the main lobes which occupy the closest tangent to the wire will continually have a decreased angle to the wire's direction of travel and they will also have the greatest intensity.

At four wavelengths long, the main lobes will theoretically have a gain of about 3dB which will occur for practical purposes in four directions closely adjacent to the ends of a straight long wire. After eight wavelengths, the main lobes should exhibit a gain in the vicinity of 7 to 8 dBd, however, this is somewhat dependent on height and location of the wire to surrounding objects which will modify the lobe patterns.

The increase in gain for additional length is relatively linear even if not staggering in intensity. Although 7dBd doesn't sound very impressive for an antenna four wavelengths long it has some possible hidden advantages. It appears that this type of radiator may be one of the few antennas which departs from the accepted reciprocity law - which simply means that it will receive with precisely the same gain as it transmits. There is no definite scientific evidence in support of this fact but many users report that receive gain characteristics of long wires seem to show a decided improvement in performance. This is though to be a result of the great diversity of spread out capture area of such an array.

When two long wires are combined to form a vee or rhombic array the main tangential lobes join together to form one major lobe and thus their individual gains are additional. **Figure 3.**

DIRECTIONAL CHARACTERISTICS

When erecting a long wire type antenna there are several factors which require consideration before the final project design is decided. Because they are directional gain arrays it only stands to reason that one should consider radiation angles for the particular length in question. This feature is primarily dependent on two inter-related factors:

1. **The direction of required maximum radiation.**
2. **Available space for erection of the antenna.**

Long wire installations may be bent at one or more points along their length with the resulting lobes less easily predictable than for a straight wire. It's almost worth running one around the perimeter of your property just for curiosity. You may be pleasantly surprised at the results. In this way many CBers will be able to successfully attain a total of eight or more wavelengths.

Since our main consideration with this type of antenna will be the main lobe directions, a graph of approximate radiation angles with respect to the conductor is shown in **figure 4**

Having established a bearing for main lobe radiation - the USA or Europe for example - the available length across your property can be roughly calculated and final computations can be established from the graph with respect to wavelengths and resulting lobe angle. It is also worthwhile calculating the coverage of the three remaining major lobes. Don't disregard the secondary lobes because chances are that some of these may still offer greater gain than a dipole.

There may be some distortion to the main lobes due to nearby objects, but, overall the angles predicted from the graph will be a fair representation of practical results.

FEEDING A LONG WIRE

There are a number of satisfactory methods to couple RF energy to this type of antenna including transformers with balancing devices for open feeders, coaxial cables with matching networks as well as a number of unique calculable arrangements to complicate the whole situation.By far the easiest is to extend the aerial wire directly down to a simple antenna tuning unit mounted close to your rig.

The simplest type of tuner - described later - will provide a reasonable impedance match to your set while providing the necessary transformation to feed the antenna.The antenna impedance will vary as a function of its length, height above ground, conductivity of the ground and several lesser influencing factors and could range from about 250 to 700 ohms. Therefore, it would be **imprudent** to connect an antenna of this type directly to the rig's antenna socket - chances are that

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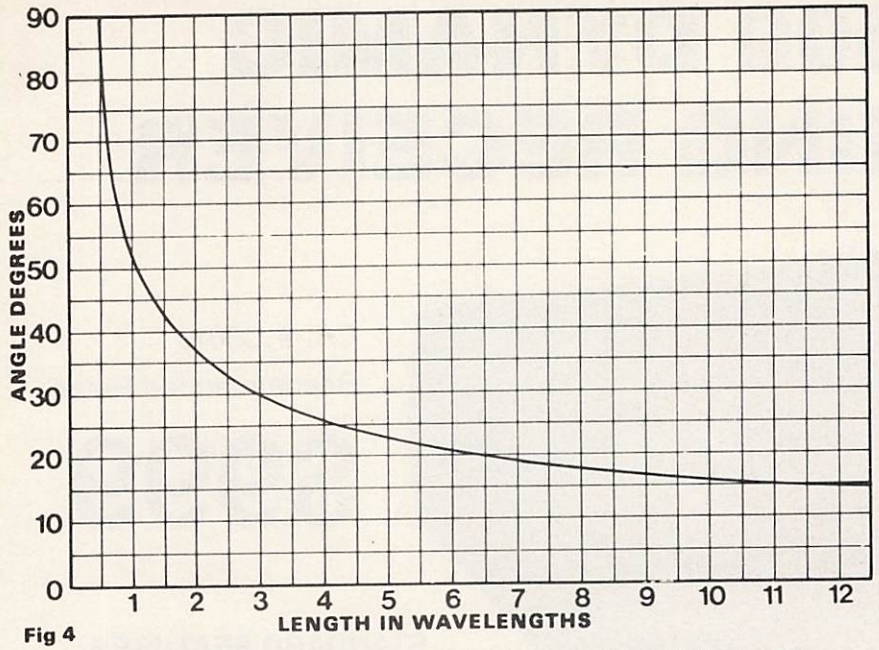


Fig 4

This graph represents the radiation angle for the main lobe of a long wire antenna from its axis related to antenna length in wavelengths. Plotting for 7.5 waves we find that the main lobe should theoretically occur at 18 degrees from the axis.

WHY NOT USE A LONGWIRE ANTENNA ?

(continued....)

your CB might just go out in a blaze of splendor from the resulting high VSWR.
DON'T TAKE THE RISK!!

The block diagram in **figure 5** shows the correct method for tuning your antenna to match your rig's antenna impedance with an SWR meter inserted between the rig and the antenna tuning unit.

PRACTICAL ANTENNA

The most practical and simplest of the long wires to install is the resonant variety.

Non resonant or random length types require a terminating resistor at the far end which must reasonably approximate the feed impedance and needs a more sophisticated feeder system. The terminated long wire also exhibits a "single ended" polar plot with one main lobe extending away from the feed point.

A resonant long wire antenna is more rudimentary, only requiring that the length of the wire be approximately resonant at the operating frequency.

The first step is to calculate a measurement for one wavelength at the desired frequency.

Using the formula:

Length in metres = 300 divided by Freq in MHz

We find that 11.11m of wire will be needed for one wavelength at 27MHz. Therefore an antenna which is four waves long will require about 44.5 metres of wire.

The best type of wire to use is 12 to 14 gauge hard drawn copper, or copper plated steel wire of similar size. These types are most desirable because they are tough and least likely to stretch over a long span. A cheaper alternative which will suit most applications is multi - stranded copper earth wire available from most electrical component suppliers. This wire is much heavier and unless supported at regular intervals along the span will suffer from "droop" after a few weeks. Over a span of say 60 metres, the wire might stretch a metre or so given enough time which will of course change the resonant length and may require trimming at a later date. Still, measurements are not highly critical and a small amount of stretch is acceptable.

The run should be supported - preferably in a straight line - high as possible from the ground, for best performance with a minimum height of one half wavelength giving good results. The wire should be insulated from each support point by plastic or ceramic insulators. If these are not available, drilled pieces of perspex, polystyrene or other types of strong insulating material will service quite well.

Having calculated the positioning and length of your antenna - the longer the better - and having arranged the system in such a way that one end of the wire will enter your operating area, it will be necessary to guide its entry with further insulators. These can be the expensive wall insulator types, or at a pinch, TV ribbon type wall stand-off insulators will suffice.

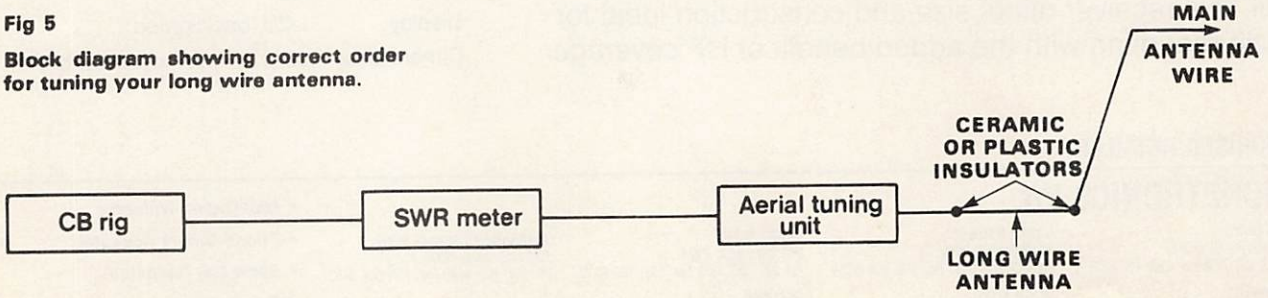
Where the wire enters your room, care should be taken to prevent any metallic contact which may detune the antenna - if a clear aperture is not available, use commonsense and insulate that point with a number of turns of PVC tape. "Commonsense" is the operative expression.

Your antenna is now ready for coupling to the transceiver. To do this you will need to build a simple antenna tuning unit which, once constructed, will be useful for any number of long wire antenna experiments.

(continued over page...)

Fig 5

Block diagram showing correct order for tuning your long wire antenna.



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The AR2500 is a compact, synthesised receiver offering continuous access to frequencies between 500KHz and 1500MHz. In addition, it allows computer control via an in-built RS 232C port located on the rear panel allowing asynchronous communications with a personal computer for spectrum display and database compilation. Massive channel capacity and wide frequency coverage coupled with multi-mode reception make this the most dynamic scanner on today's market.

High speed microprocessor control and triple conversion receiver techniques make this unit suitable for the casual listener or professional monitor. Dimensionally small, this receiver offers size and construction ideal for vehicle mounting with the added benefit of HF coverage.

SPECIFICATIONS

Coverage:	500KHz-1500MHz
Sensitivity:	.33uV NFM, 1.0uV WFM, 1.0AM/SSB/CW
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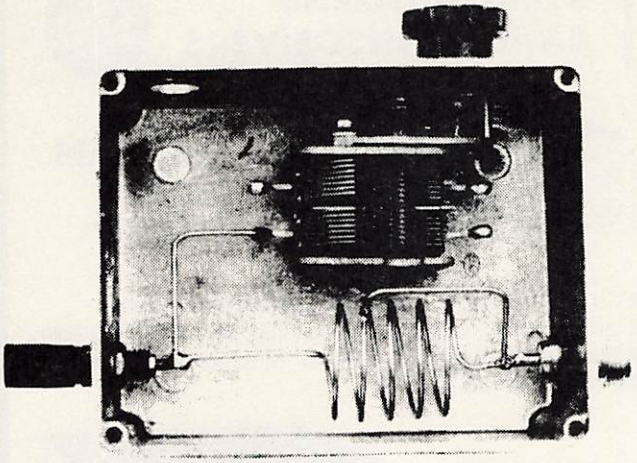
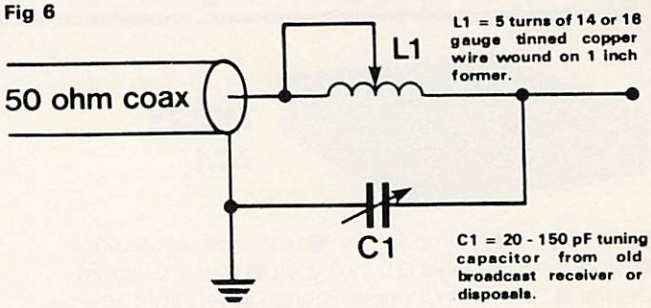


Fig 6


L1 = 5 turns of 14 or 16 gauge tinned copper wire wound on 1 inch former.
L1
50 ohm coax
C1
C1 = 20 - 150 pF tuning capacitor from old broadcast receiver or disposals.

Schematic diagram for a simple long wire antenna tuner.

WHY NOT USE A LONGWIRE ANTENNA ?

(continued....)

ANTENNA TUNING UNIT

Although the circuit shown in **figure 6** is only a basic type of antenna matcher, it will give good results and offer quite an acceptable load to a CB rig when correctly tuned while transforming the 50 ohm impedance to suit that of the antenna.

The components can be easily mounted on a piece of particle board or other wood in the absence of a more suitable enclosure. The coil L1 consists of about 5 turns of 14 or 16 gauge tinned copper wire which can be wound on a broom handle or something of similar diameter. This should be tacked onto the base board to give added rigidity.The inner conductor of a short length of coax is connected to one end and the opposite end of the coil will become the antenna connection which should preferably be connected to a terminal - the type used on CB power supplies will work well.

The tuning capacitor connects to the braid or outer conductor of your coax - the frame side of the tuning capacitor ... this is important - and the other connection goes to the antenna end of the coil.The tapping connection shown on the circuit can be a short length of wire with an alligator clip attached to one end. This will be used to experimentally find the correct turn on the coil when adjusting the tuner for optimum match to the antenna.

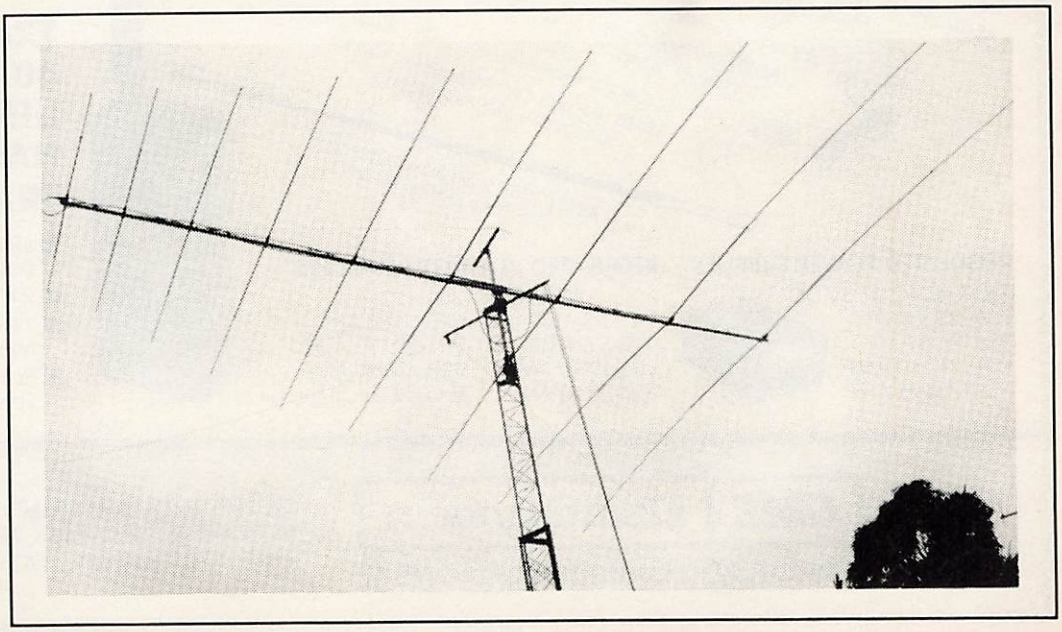
Care should be taken not to touch any metal parts when the tuner is in operation as quite high voltages will be developed in the circuit. All wiring in the tuner should be as rigid as possible - within reason - and a well insulated plastic knob is a must for the tuning capacitor. Anything which moves inside the tuner - apart from the capacitor plates - could have a detrimental effect on the tuning stability. Make sure a good earth is available for connection to the point shown on the circuit diagram. When the correct coil turn is established, the alligator clip may be dispensed with and a direct solder connection made in its place.

TUNING PROCEDURE

Connect your system as shown in **figure 5** with an SWR meter between the rig and antenna tuning unit. Adjust the tuning capacitor for about half mesh of the plates and connect the coil tap to the middle turn.

Quickly check the VSWR - using AM only - and if the reading is high, move the tap to an adjacent turn. Repeat this procedure until minimum VSWR is obtained. When you are satisfied that the best connection point has been found, adjust the tuning capacitor for a further improvement. The tapping point may also be moved around the selected coil turn and the capacitor turned until the absolute minimum SWR is obtained. It may not be possible to get a 1:1 match, but in most cases the SWR should be better than 1.3:1.

You should now be the proud new owner of a fully operational long wire antenna system which will serve you well for many years. It may even perform better than your usual base antenna.



If all else fails you can always purchase a nice big Log Periodic such as this one from ATN antennas.

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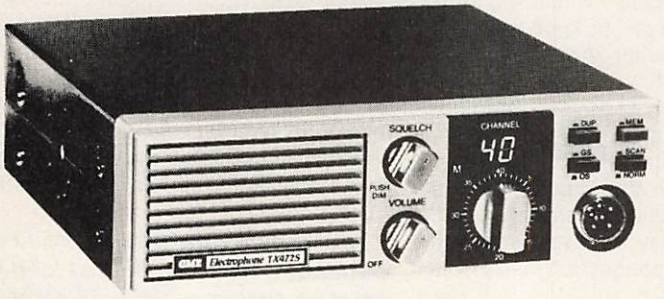

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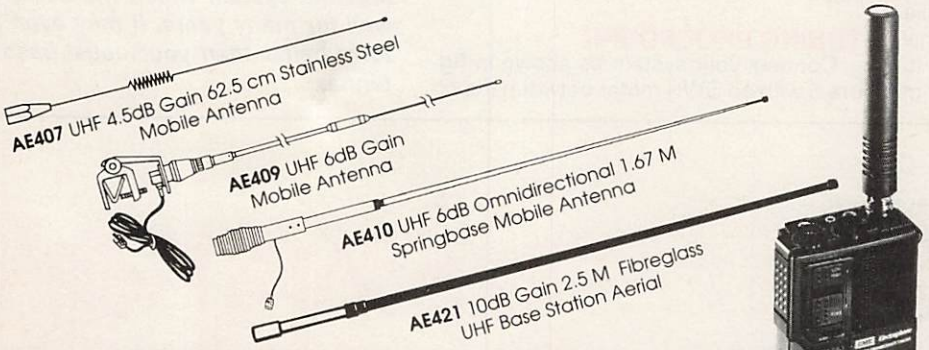
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bandspread

FROM DC TO DAYLIGHT *with Greg Towells*

Welcome to Bandspread for this edition. For all those readers who are into tinkering with their radios, this is the column to watch over the coming issues of CBA. I have information on expanding frequency coverage to increasing scan rates on all sorts of radios...and it will be appearing here in Bandspread. Stay tuned!!

TANDY PRO-2004 MODIFICATIONS

Here are some mods for the immensely popular Tandy PRO-2004 scanner. This modification will increase memory channels from 300 to 400, increase scan and search speeds, and set the stepping rate at 869MHz to the correct rate of 30kHz steps.

Remove the four screws from the rear and slide the cover off the radio. Turn the unit upside down with the controls facing you. In the centre you will see a large board with five plugs connected to it and a metal shielding cover. Remove the cover, locate diode D512 and cut it in half (don't panic). You should notice the next two diode positions are vacant (e.g. D511 and D510 and are not marked), also you will notice that there is a position vacant where D514 should go. Now for the difficult part (now you can panic)....remove the cable connector closest to the diodes (CN501), remove the seven screws and turn the board over. Fit a diode across position 514 noting the same polarity as the others (cathode faces upwards). Also fit one across position 510 (use 1N48 Silicon or equivalent). The holes are plated through so there will be some drama in removing the solder so I suggest using an electric solder sucker to reduce the frustration involved in this stage...

That's all that is needed and now your scanner will have 10 banks of 40 channels, it will scan faster in the fast rate, and will step at 30kHz in the 869.00 to 895.00MHz band...and you will have the satisfaction of doing it yourself (if everything is working just I say you can now stop the panic)! Seriously, it is really a simple modification and it DOES do what is stated above. Also, the above mod will not effect any of your stored frequencies, so don't worry about having to re-enter your 299 favorite freqs!

Thanks to Doug, VK2JDR for that one.

BROADCAST MOD FOR TS140/TS680 TRANSCEIVERS

This is a mod to improve the broadcast band sensitivity for Kenwood TS140 and TS680 transceivers. Between 0.5MHz and 1.6MHz, attenuation is added to supposedly reduce front-end overload on the broadcast band. Many broadcast band DXers would find this a **HIGHLY UNDESIRABLE** feature, after all if overload is experienced, then one would surely use the front panel switch...after all, that's what it's there for!

This mod will restore the sensitivity.

Open the transceiver and locate IC1 (the signal unit, M54581P).

Cut the land between IC1 pin 11 and R7.

Cut the trace between IC1 pin 12 and R10.

Add a small signal diode (1N914, 1N4148) between IC1 pin 11 and R7 (Cathode towards R7).

Add a small signal diode between IC1 pin 12 and R7 (Cathode towards R7). Trace the land from pin 11 and 12 of IC1 and you will find a good place (to the left of connect CN5) to cut these traces as well as a pad to solder the diodes to.

That is all that is required. Re-assemble the transceiver and power up. The broadcast band never sounded so good, signals everywhere!!

These modifications have been tried and do work well, however, if you do not feel competent with a soldering iron, please find a friend that is! Most modern radios do not take kindly to butcher-type soldering operations.

SATELLITE INFORMATION PROGRAM

Ever wondered what goes on once a satellite is launched? Or how the ground control finds out what is going on aboard the satellite, whether the satellite is going alright or whether there is something wrong with it. Well, if you have a packet TNC there is a computer program just for you. Designed for IBM compatibles, the program is called WHATSUP5.ZIP and will be available on Shortwave Possums BBS on (02) 651-3055. WHATSUP5.zip allows you to capture, decode, display and extract for analysis telemetry from DOVE or OSCAR amateur radio spacecraft. Why then would you want to capture and decode satellite telemetry ?

Orbiting Satellites Carrying Amateur Radio (OSCAR) and Digital Voice Encoder (DOVE) satellites send back volumes of telemetry daily and apart from a few command stations, no-one seems to be doing anything with it. Amateur radio operators tend to concentrate on the communications capabilities of the spacecraft and ignore their telemetry completely. If we do listen to a beacon, it's usually just to check that the transponder is on.

The telemetry can tell us a story.

It can tell us what is happening to both the spacecraft and its environment. As such it has a tremendous educational potential which has remained just that - a potential - for some many years.

Before every satellite launch, the equations and format for the spacecraft telemetry are published by AMSAT. The telemetry tells us about the health and welfare of the spacecraft itself and something about the payload. Spacecraft health and welfare information tells us about the battery, solar cells and on-board computer status. Payload information can range from information about transponder loading/utilization to data from instruments that measure the environment of the space in and around the satellite. Battery telemetry is used by the command stations to determine when the spacecraft can be used, and when the transponders should be shut down. WHATSUP5 is a program that can provide this information to anyone interested in the day to day operation of amateur satellites.

WHATSUP5 has many features including real-time, interactive and play-back modes, automatic capture to disk of raw telemetry, extract of telemetry channel data to a database or spreadsheet readable file for further analysis, link quality measurement and capability to display and print the telemetry as it is received.

Once you are set up with this program, an ideal frequency to listen on is 145.825MHz. Many OSCARs and DOVE satellites unload their telemetry there, so it is a good starting point. Also, many packet bulletin boards regularly post items of information including operating frequencies of most amateur satellites. Signals can be received on simple antennas and are frequently full scale in strength. I use a Tandy discone mounted just above the roof and have consistently received huge signals from amateur satellites, so why not give it a go.

Please note that while we have no doubt that the modifications in this and/or other columns or articles work as described, CB Action staff and/or contributors accept no responsibility for any damage caused by carrying them out. Readers should also be aware that any modifications made, other than those made by the supplier, will almost certainly void any warranty....Editor

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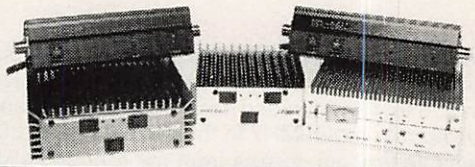

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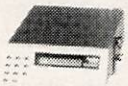

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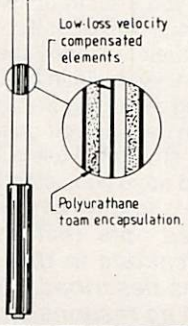

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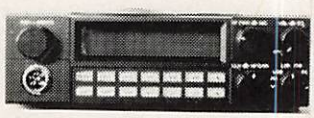

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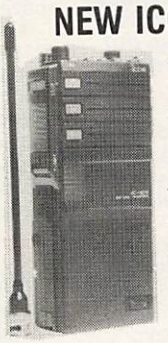

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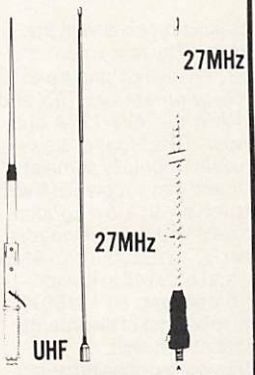

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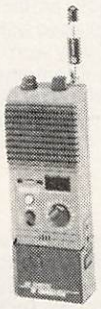

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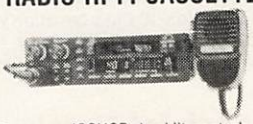

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WHERE TO LISTEN and WHAT'S BEING HEARD

Radio teletype, SITOR, fax and packet - these are some of the exotic modes which co-exist with voice communications in the HF utility bands. Although our HF logsheets have concentrated on voice traffic there's plenty else out there and these specialised areas are favored by large numbers of US monitors. Why not here in Oz?

Maybe it's because the special receiving equipment is not readily and cheaply available in this country? Or we don't have magazines like Pop-Comms and Monitoring Times to promote the hobby, or our clubs and user groups don't go in for non-voice traffic? I don't know the final answer.

Looking at the HF radio spectrum between 3 and 30 MHz you can see that hams occupy 2.8 MHz or 10.3 percent of the band; and shortwave broadcast stations, another 3.1 MHz (11.6 percent). Then come the ute stations with a staggering 21.1 MHz, which weighs in at 78.1 percent of the available spectrum space! Yet only a fraction of this is voice communications. So how about it fellow monitors? If you have the capability to attack these special modes, go get 'em! And when you've intercepted one of these stations don't forget to write us with your log entry. Remain anonymous if you wish but, we really would like to give a higher profile to this sadly lacking area which overseas is regarded as a "hobby within a hobby".

For hardware you'll need a good communications receiver with the ability to tune into the very precise frequencies used by non-voice modes. You'll also have to add a device to interpret these signals and convert them into on-screen copy. Some good equipment for RTTY and fax are the popular AEA PK-232, Kantronics' KAM, the MFJ-1278, and the Universal M-900, M-1000 and M-7000 models. The biggest drawback is that this equipment can be very expensive. Hopefully some of you out there already have the necessary gear and can supply CBA with some regular loggings. For my part I'm going to give you a few frequencies, stations and suggested times to listen to help you get motivated.

The Soviet news agency TASS broadcasts in RTTY/Baudot on 18125 and 18385 kHz at 50 baud/425 shift at 1145z, and on 9145 kHz with 50/425 at 1300z. The US Information Service broadcasts on 11150 kHz at 2100z using 75 baud/425 shift. As a general rule most of the international press stations still using HF RTTY operate at 425 shift.

SITOR is "Simplex Telex Over Radio", a 7-bit synchronous error-correction mode used in a great many maritime and diplomatic situations. Most SITOR is at 100 baud/170 shift and can be heard between 12465 - 13100 kHz.

Frequency division multiplex or FDM comprises several narrow-shifted Baudot channels. Sixteen channels are usually involved, with press agencies at 50 baud on channel 1, 75 baud weather on channels 2 and 3, and encrypted private traffic on channels 4 to 16. Reception is best on LSB with an IF filter of 4 to 6 kHz. Try 8032, 9961, 10258 and 13353.

There is also the ARQ mode, also known as "time division multiplex". This 7-bit synchronous error detecting system uses full duplex on both 2 and 4 channel systems. The 2 channel variety is labelled ARQ-M2 and 4 channel is ARQ-M4. Station BZG41 in China operates ARQ-M2 at 96 baud/425 shift on 7923 kHz. From Sweden SDN10 broadcasts on 18295 kHz under ARQ-M2 at 96 baud/425 shift. There is also ARQ-E and ARQ-E3 but, let's not get too carried away here!

Most people are familiar with fax machines which operate over the phone lines but, there's lots of fax flying across the airwaves too. Two terms you'll come across in fax are LPM (lines per minute) and OIC, the "index of co-operation" which expresses the relationship between the width of the image and the number of lines per inch. WLO Mobile Alabama continuously faxes weather maps to ships on 9157 at 120 LPM and an OIC of 576O. WWD in La Jolla (pronounced La Hoya) California faxes weather on 17405 at 120 LPM/576 OIC during Californian daylight hours.

Marine Monitors QSY

As announced in my column in the Jan/Feb issue, extensive changes have been made to the worldwide HF marine frequency bands and all vessels are now required to operate on the new frequencies for ship-shore-ship distress, calling and working. The cut off date for the new channels to be introduced was July 1, 1991. Mariners have had to madly scramble for their marine electronics supplier to get the new crystals or have the radios reprogrammed by the gazetted date.

Note that the 2 MHz frequencies such as 2524, 2284, 2032, 2201 and 2182 kHz are unchanged. The alterations are all above 4 MHz for vessels calling and working OTC stations, and radphone channels are also affected. In addition there are new frequencies in marine bands between 8 MHz and 22 MHz.

These changes were made preparing for the introduction in 1992 of the new Global Maritime Distress and Safety System, which will improve considerably on the current SOLAS (Safety of Life at Sea) system. For complete frequency listings dig out your copy of CBA from Jan/Feb 1991.

HF Radphone Beats UHF Cellular!

Still on a nautical note, OTC being the little capitalists they are (and there's nothing wrong with that!) will take money from anyone. And they certainly demonstrate this when land mobile (car or truck) operators apply for marine radio licences and fit marine frequencies to their vehicles' two-way HF sets.

Why would anyone want marine radio channels in their car?

These aren't any maritime channels, they are allocations for OTC's Radphone phone-patch service. If you thought that marine Radphone was strictly for the boaties then think again! For a base rate of $2.50 per minute there are plenty of land-locked people using this system. I know a few of them and they are more than happy. One user in particular is a news cameraman with an east coast TV station. Not all that long ago he was attempting to track a Customs surveillance operation heading south along the coast. When the surveillance teams found themselves out of communications range both on their cellular phones and UHF two-way system, our man was still able to contact his office via HF radphone working through OTC's coast radio stations at Brisbane or Sydney. I must add here that this gentleman comes equipped with on-board smarts and as such he carefully vetted each and every word uttered over the Radphone frequencies so the operation was not compromised. It was more a case of "I'm now at Coffs Harbour..." or whatever, as opposed to passing any operational information across the public system.

Logsheet Time!

Straight into our latest utility logsheet now. If you have a contribution, or a whole stack of them, send them to Bob Bell's Utility Traffic, PO Box 301 Chester Hill 2162. List frequencies in kilohertz and in ascending order (lowest to highest), including as much of the following information as possible: frequency and zulu/UTC time, mode, callsign of station monitored and details of traffic heard. Remember, we are on the look-out for CW, RTTY and all exotic modes. So send in those loggings, join the rapidly growing ranks of HF Utilities contributors and assist others to enjoy the hobby more... and isn't that the name of the game?

Utility Logsheet

- **2201 1803z USB** *Perth Radio VIP Cyclone warning, followed by traffic list and advice of VIP listening on 2182, 4125 and vhf channel 16 ("Henry", NSW)*
- **2207 1635z USB** *Auckland Radio ZLD Shipping weather for Farewell and Bay of Plenty ("Henry", NSW)*
- **2965 1641z USB** *Bangkok Volmet, Thailand Aero Volmet terminal information for Bangkok, Vientiene, Phucket etc. (Bell, NSW)*
- **4663 1634z USB** *Moscow Volmet, USSR Aero terminal information for Kafir and other areas, female announcer stating snow and showers to be found in those regions (Bell, NSW)*
- **5643 1439Z USB** *Honolulu Radio Wkg Qantas 11 ex-Sydney non-stop destination Los Angeles, requesting FL 390. (Collins, Vic)*

- **5643 1448z USB** *New Zealand 51 Wkg Honolulu, answering selcal and confirming cruising FL 370 (Collins, Vic)*
- **5643 1500z USB** *Continental 15 Wkg Honolulu Radio at position BOILS in the block FL 330 - FL 350 (Collins, Vic)*
- **6506.2 1704z USB** *NOJ US Coast Guard stn Kodiak, Alaska with coastal weather for Alaska furnished by National Weather Service Anchorage. Stn ident heard precisely at 1704z ("Sunset", NSW)*
- **6532 1435z USB** *Honolulu Radio Aero Wkg Northwest 3, United 848, Japan Air 78, and Japan Air 771 "Sunset" NSW*
- **6693 1458 USB** *"Bullock" aero with posn "35 South, 152 East" ("Sunset",NSW). This could possibly have been "Baldock 63", a Learjet operating out of Nowra NAS. It's call is VH-ULT, serial A35-463 and uses selcal AD-CE, on duty for low level fleet support with the Royal Australian Navy. Keep a watch on 6693, very interesting that it showed up there!*
- **7650 0135z CW** *Five digit clandestine spy numbers stn, repeating "89735" over and over. (Alexandrowitz, NSW)*
- **8022 1725z USB** *Australian fishing boats discussing catches and saying that vessel "Territory Pearl" had lost its net. Some rather spicy language used throughout. ("Henry", NSW)*
- **8140 1500z USB** *United 815 wkg Sydney Skycoms with phone patch to United Operations Sydney. Aircraft instructed to request Romeo 233 routing to Sydney from its present position. Background music on transmission, possibly emanating from a radio in United offices ("Sunset", NSW)*
- **8867 0149z USB** *Qantas 43 wkg Sydney Radio, FL 370 maintaining mach decimal 84 (Bell, NSW)*
- **8975 1845z USB** *Air Force Sydney wkg Air Force Auckland with radio chk between stns... 1845z is very early in the day for RAAFies! ("Henry", NSW)*
- **9251 1932z USB** *Numbers stn reading groups of five numbers: "57731", "44506" and "25672" delivered by female announcer (Odell, NT)*
- **10078 1750z USB** *Qantas 18 wkg Qantas Operations advising ETA on this company frequency (Blore, Qld)*
- **11123 1800z USB** *Numbers stn, female with American accent repeating "126, 126, 126, 1234567890" (Saunders, SA)*
- **11234 1926z USB** *RAF Cyprus wkg several three-letter callsign stns with coded messages (Kroll, Vic)*
- **12950 1747z USB** *Numbers stn with "Victor Lima Bravo 2" repeated by female with American accent. (Saunders, SA)*
- *13264 1808z USB Shannon Volmet Aero with terminal weather for Heathrow, Gatwick, Amsterdam, Paris, Madrid etc. (Jones, Qld)*
- **14160 2330z USB** *Y8POL (ham) Antarctic stn wkg worldwide hams in his "Friendly DX Net" and inviting QSLs. This is a German operator spending time as part of a scientific survey party in Antarctica, gave name as "Gunter" or "Gunther". (From Phil "Yuppie" Palmer, Vic)*
- **14752 1900z USB** *Unknown numbers stn, female with American accent repeating "383, 383, 383, 1234567890". This one from SA reader James Saunders who's right into the "numbers game" - maybe he'd make a great politico!*
- **15717 0621z RTTY** *GXQ England British Army sending RY's at 50 baud/170 shift (Rogers, Qld).*
- **17370 1835z USB** *Unknown "numbers" stn, female with American accent repeating "512, 512, 512, 1234567890" (Saunders, SA)*
- **33.25 MHz 0325z FM** *"Charlie Battery" Wkg unheard stn in what sounded like a training exercise. This is a very unusual copy but, one I have accomplished before on other low bands from California and Johanesburg using nothing more than a low-band quarter wave whip outside the house. Good skip! (Bell, NSW)*

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Whether you are running the latest Realistic or the earliest Regency, David Flynn has some ways to get more from your scanning...

You all know infamous CBA spy Bob Lopaka. He's the man barred for life from the Australia's Wonderland amusement park for exposing its radio secrets in these pages. His photo graces a 'Wanted: Dead or Alive' poster at every McDonalds' drive-through, for his authorship of the McScanning feature some issues back. Recently Bob exposed the where and how of monitoring the military, so by now he's living on borrowed time! Bob travels a great deal, and is rarely without a scanner. This is how he captures all of those frequencies, codes and callsigns on services he 'targets' - by following the boy scout motto of being prepared, keeping his AOR-1000 always within reach.

One friend of mine who lives on the NSW Central Coast uses his scanner to make life easier when dealing with the interminable delays affecting inter-urban train services. His wife commutes to the city each day and he drives down to the station each evening to meet her. For the first month of this routine he would dutifully be at the railway station at the appointed time, only to spend some 20 or 30 minutes waiting for the train. Then inspiration struck! Now he relaxes at home, desktop scanner tuned to the local signal box, and waits to hear the train pass through. Only then does he drive to the station.

On those occasions that I drive to work, I find my mobile scanner (a Bearcat 760XLT) invaluable for keeping tabs on the traffic. My route takes me down the F4 freeway, thence via any number of diverse routes, shortcuts and switchbacks towards the northern side of the harbour. Even skirting the edge of the morning peak, I'm lucky to make it in an hour. The Bearcat comes into play for listening to the various city police channels for reports on where the trouble-spots are, and tuning into the Polair chopper for what is literally a birds' eye view of the traffic pattern. At any stage along my trip I can change course to avoid the jams and take advantage of a number of alternative routes to reach my destination. This saves time, money, frustration, and on the whole VKG can be better listing than some breakfast programs.

Another tale... CBA columnist Bob Bell is an avowed airhead who enjoys aircraft in general and aeradio in particular. Bob is considered a life member of the 'Gate 20 Club' - a loose and informal assembly of regular aircraft spotters and enthusiasts who gather on weekends at Gate 20, box office seat for watching traffic land and depart from Sydney's Kingsford Smith International Airport.

If an odd or unusual plane arrives in Sydney, you can be sure Bob will be there - Bearcat scanner in one hand, video camcorder in the other and somehow juggling a pair of binoculars and a 35mm SLR camera into the bargain. And when a beauty like the Concorde visits, every air buff, newshound and member of the Sydney snapparazzi jostle for the best photo of this majestic bird. When last she graced our shores the Concorde was scheduled to arrive on runway 16, so snap-happy chappies lined the appropriate gates, lounges and observation decks for THAT photograph. But a last-minute shift in wind direction required that Concorde's inbound course be changed to runway 34. Armed with his scanner tuned to the Sydney Approach frequencies Bob was the first to hear of the change and acted immediately, securing for himself the best vantage point for runway 34 and avoiding the life-threatening scramble which followed minutes later when the announcement came over the PA. Since then, scanners have been almost compulsory amongst the Gate 20 club!

I have never seen any two scanners programmed alike. Think about it - hundreds of channels in various scanners, thousands of users with unique needs and wants from their scanner, and hundreds of thousands of frequencies stretching from 30 MHz, the ground floor of VHF, well into the microwave region above 1000 MHz. You can easily customise your scanner to make your listening easier, more efficient, to catch more action on air. Before we get into this, consider how scanning can be more than just a passive, sit-at-home-and-listen hobby.

Know Thy Bands

A working knowledge or at the very least a familiarity with the VHF/UHF commercial allocations gives you a great advantage. The bands are divided into several segments for simplex and duplex operation. Knowing the location of these sub-bands and the duplex frequency offset makes it easy to match input and output signals.

You should also learn more about your favourite services, and how they use their spectrum. A good example is the national 64 channel UHF police allocation. Sydney's VKG uses a 'voting' system to provide each district with three to five channels, with transmitters located at different sites. All feed into the radio room and traffic on any single channel is relayed to the others in the group, while the radios themselves ensure they are on

the strongest channel for their location. By tuning into all 64 channels and noting those that carry identical traffic, a Sydney monitor can easily determine which channels are used for each 'group' or district. This very useful information is handy in a number of ways.

Most VKG enthusiasts need only listen to a handful of channels, one per area, to keep in touch with the whole city. But with different transmitter sites carrying the same signal, the strongest channel will depend on your location. What is solid copy for one scanner enthusiast may be weak or noisy for another. My Blue Mountains home comes under the wing of VKG's outer-west or J-district. Ask any Sydney scanner nut for the 'Juliet' channel and they'll probably tell you it is 21, or 468.350 MHz. This is the transmitter at Kurrajong and indeed it is strong throughout most of Sydney, but it is only one of four frequencies in the area. If you live around Penrith or the lower Blue Mountains then 21 comes in quite scratchy and you'll find the best frequency to be 468.025 MHz, channel 8. Further up the hill towards Katoomba and channel 56 (469.225 MHz) is the go. There's even a small area along Hawkesbury Heights which is served by channel 43 (468.900 MHz). Of course, if you didn't know that VKG offers you a choice of channels for your listening pleasure then you would be tuning to the 'main' allocations in each group, and possibly to frequencies and transmitters which provide far from ideal reception.

Maybe a Better Antenna ?

A friend living in Sydney's northern beaches once mentioned to me that his VKG reception was quite poor. Should he get a better antenna, he asked, or even a new scanner? The solution was much less expensive. His scanner had been programmed with the 'wrong' channels, for transmitters which suited much of the city but were far removed from his QTH. All we did was replace these with the local allocations, beamed from the Bilgola Water Tower just a few kilometres away. He now has VKG Sydney-wide and rock-solid, and it didn't cost a cent! So make up a list of allocations for all areas. Program the first group into their own bank, scan all channels and determine which comes in strongest. Repeat this one group at a time and you'll have VKG listening tailor-made for your QTH.

Knowledge of the VKG voting system also helps the mobile monitor, who can tune across the band as they move from area to area. I know of a security company whose beat is almost identical to Sydney's western suburbs 'H District'. Their night patrol vehicles have been outfitted with Bearcat 760XLT scanners with all 'Hotel' allocations. The squelch is set so that only the strongest signal will break the mute, so each car can always copy VKG without hopping from channel to channel - it's do-it-yourself voting!

Trunking Tips

Scanning knowledge can be likened to Pecks Paste, in that a little goes a long way. Consider the 800 MHz trunking band: the typical system runs three to five channels with inputs at 820-825 MHz and outputs at 865-870 MHz.

That's a lot of spectrum to search for less than a dozen channels. The trick is in knowing that trunked channels in each group are spaced exactly one megahertz apart.

So if you hear a signal on 866.0125 MHz, then all other allocations within that group will be in 1 MHz steps either side - the lowest being 865.0125 MHz, and the rest from 867.0125 MHz through 869.0125 MHz.

If you are an adherent of the MobileNet cellular phone service it is worth noting that those annoying data and control signals have been allocated their own exclusive sub-band of 879-881 MHz. So to make your (illegal) listening many degrees easier, exclude this segment from your search operations and instead work in two discrete groups of 870-879 MHz and 881-890 MHz.

A Final Hint

A final hint for the VKG fan club, this time for country dwellers: most country police use simplex mid-band VHF channels and while you can hear the base the mobiles may be out of earshot. Did you know that many areas have installed cross-band repeaters which relay base and mobile traffic onto a UHF channel? It's intended to make life easier for visiting city vehicles that aren't fitted with VHF, but it's a boon to local monitors - and the UHF system is so well-designed that in many cases the signals out-distance VHF. So hit that search key and check out the 64 channel UHF allocation.

Again, there are rules and exceptions to rules. You might want every frequency belonging to a service programmed into your scanner for any of a number of reasons - perhaps you are highly mobile and want every channel available at the touch of a button, or want to listen to operations on secondary or 'back' channels. It all comes down to thinking about how YOU operate, and then making your scanner work accordingly.

A mobile or handheld scanner can be a big help in finding out where there are traffic delays, roadworks and what-have-you....

Much of the forgoing is related to monitoring from home or in the car. But, scanning is a hobby which knows no bounds.

To my mind, portable or handheld scanners are the way to go. They are an ideal first scanner, and an essential companion to a desktop unit. If you've yet to buy a scanner, there is little reason not to consider a handheld. Small they may be but, gone are the days when "compact" meant "compromise". The typical handheld scanner will cover the most necessary bands - VHF mid (66-88 MHz), VHF high (166-178 MHz) and UHF (generally around 400-520 MHz), with the 108-136 MHz VHF airband a likely inclusion.

(continued over page...)

Scan To The Maximum

(continued...)

All this will be able to be programmed into up to a hundred channels on average, divided into banks of 10 or 20 memories. The scanner will lock out the boring ones, set a favorite as the priority, and search for new frequencies into the bargain. Desktop scanners just build on this foundation with more memory, more megahertz, more versatile and desirable features.

Yet even then there are some handhelds which suffer little from comparison. The desktop receiver may have an edge in raw performance and specifications, and as such there is no replacing it for the keenest enthusiast. If you are not by nature a traveller and you happen across a bargain-priced desktop unit such as a Realistic PRO-2004 or 2005, do not ignore such an opportunity. But, for general scanning a handheld can do very nicely. It will let you take your hobby with you. And if you own a handheld scanner which never sets foot outside home or hearth, you are missing out what can be the best part of your hobby.

You CAN Take It With You

Going "portable" doesn't mean wearing the scanner holstered on your hip like some kind of wireless John Wayne. You might settle for keeping it in your briefcase or carry-all bag on the way to and from work, throwing it in the car or even taking it with you on that short business trip or weekend away. You may not be glued to the scanner, but, it is there in case you need it.

As good as they are, handheld scanners do have room for improvement. Most units come with a helical whip broad enough to provide adequate reception down to 60 MHz and up to 500 MHz or so. If your listening is carried out almost exclusively on UHF or VHF you will find an antenna wound and cut for that particular band will make a noticeable difference. Until recent times there has been a dearth of decent replacement antennas for portable scanners. An increasingly popular choice are whips designed for dual-band amateur handhelds that cover the 144 MHz and 430 MHz ham allocations. These whips will give you excellent signals on the VHF-high and UHF commercial bands, and among them the Diamond RH-77 is most worthy of mention. If you still want the best of all worlds, then Tandy Electronics have two telescopic whips that fit the bill. They are rated for wideband 25-1300 MHz coverage, one including a centre-load coil for added gain. Both retail for less than $20, unbeatable value for your scanning dollar.

Before long, your handheld scanner will become as essential for travelling as the car keys and sunglasses. You might find it worthwhile to put together a standard "kit", beginning with the charger - you never know when you may need it. A 12 volt DC adaptor, to power the scanner off the cigarette lighter is also recommended. Add the standard aerial, and any other whips - low-profile stubbies, duo-banders and such. Throw in that indexed frequency guide, and you're ready for action. I use a vinyl audio cassette carry case, of the kind readily available at most music stores and sound shops. It comfortably holds my Cobra SR-15, charger and car adaptor plus a stubby UHF whip, bottom-loaded telescopic stick and frequency pocketbook.

Delays, Lockouts and Priorities

Unless you have a scanner with a very fast scan rate, indiscriminate use of the delay key will noticeably slow things down. There may be no real reason to induce this few-second delay into the process when you are monitoring routine traffic. The very idea of a scanner is to "scan", to flick like fire through the channels.

Certainly, use the delay on an important frequency or when things hot up. However, too many stop-starts can mean your scanner is only moving at half the speed. Of course, not everyone wants to make a frantic dive for the "hold" key when you happen across some action, and that's the very reason for the delay. Still, you don't have to use it all the time.

The priority feature falls into the same category. If you set this to keep an ear on a highly active frequency, all other channels will be hindered by constant interruptions whenever the priority channel is busy. Perhaps you use this for your local police channel. Unless you crave to hear every word, every rego check, every carrier and repeater tail, it may be better to treat this as any other channel and not jam up the works. Use the priority key by all means but, do so with a bit of thought. For those who use their priority channel feature to a great extent, here's a handy way to make your own set of priority channels, one in each bank.

Let's assume you have a bank of twenty channels. By placing the same frequency in channels 5 and 15, you'll ensure it is scanned twice each pass, making it into a pseudo-priority. Of course, it doesn't have to be channels 5 and 15. It could be 10 and 20, 3 and 13, any channels that are a half-bank apart will do. Or, put them one third of a bank apart - in a hundred channel bank this might be 30, 60 and 90 - and they'll get a look-in three times around.

As for the lockout, this is one of a scanner's most under used features. Just because a frequency is in the scanner's memory it doesn't have to be scanned. You can lock it out, yet it remains ready to be unlocked or called directly as a "manual" channel. I've a dozen such allocations in my SR-15 - selected emergency services, media and airband frequencies - which are only there when I need them. If you have a hundred channel scanner and a few memories sitting idle, why not throw in some "most likely" frequencies ready for when you might need them?

Memories Are Made Of This

Channel "banks" are surely the most useful feature of the modern scanning receiver. Most scanners run to five banks with anything from 20 channels apiece (for a hundred channel scanner) to 30 or 40 each, in the case of the Realistic PRO-200x series. The thousand-channel super scanners typically boast an amazing hundred channels per bank. Memory banks make your scanner an extremely versatile tool. You can program a single "local" bank of police, fire, ambulance, airband and whatever else takes your fancy - as long as you limit yourself to the local area frequencies. Then, try some specific banks with a full complement of allocations for each service.

This can extend beyond one bank for each of the "triple O" services to include railways, VHF marine, amateur repeaters, anything at all. Don't worry about duplicating channels from the local bank into these additional groups - each bank should be able to give you 100 percent listening on its own, in order for this approach to work.

Another bank can be set aside for miscellaneous frequencies, those odds and sods that you collect from CBA, fellow enthusiasts or even during random searches of the bands. If you've got the room to spare, you may even decide to have an "emergency" bank along the lines of that suggested by Russell Bryant in his recent article on being prepared for local disasters.

This group would contain all frequencies likely to become active during local storms, floods, fires or the like. There are many services beyond the big three which swing into action at these times - among them the electricity supply, Telecom, media channels, the local council and SES.

The Little Black Book

You've turned a dangerous corner when your little black book contains hot frequencies instead of hot phone numbers! But, those pocket-sized A-Z indexed books are perfect for keeping track of all those frequencies.

As with all else in scanning, how you do it depends on what you do. Again, I'll draw on experience here.

One chap I know is a sales rep who makes regular calls to a number of NSW country and regional towns. He uses a pocket-sized A-Z book, with each town listed alphabetically.

Look under "B" for Bathurst and he's got every frequency for the town at his fingertips. He often programs all the channels into a "Bathurst bank" before he leaves Sydney, keeping it locked out until he's nearer the town.

Another scanner nut has the policy of being able to listen anywhere, anytime. So his book is based on services - "A" is for ambulance, "B" is for bushfire brigades (sounds like a great kindergarten primer!). In each section he's got frequencies, channel numbers, service areas, codes, the lot.

It's easy to tailor-make your own personal scanner guide. The best bet is a ring-bound folder, which will allow you to add and remove pages at will.

Size is important for portability and convenience - try for the international A5 or A6 formats. Then buy a set of A-Z divider pages, or make your own based on service names and categories. Now that you have your own scanner directory it can hold almost anything you care to think of - I know one VKG fan who has a small fold-out map of all Sydney and NSW regions in his directory.

I've even seen a simple computer program which prints onto an A4 page, but, within A5 or A6 boundaries, so you can keep your data on the PC and have a neat and easy-to-alter frequency guide into the b_rgain.

Anyway, that's more than enough from me. Now it's your turn to get out there and SCAN!

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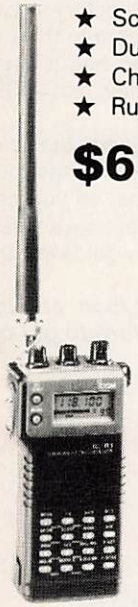

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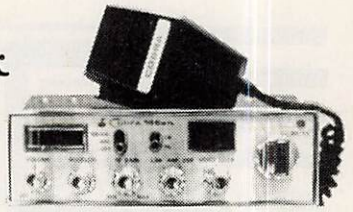

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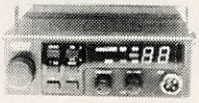

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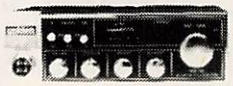

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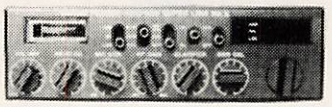

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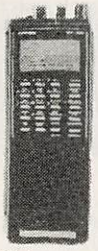

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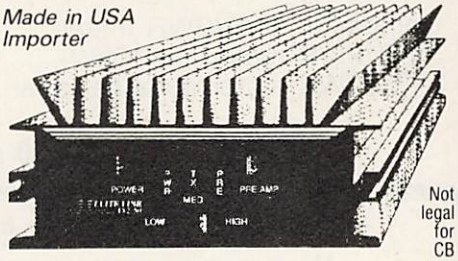

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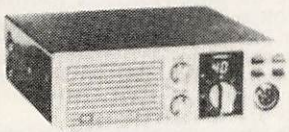

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CATALOGUE UPDATE

THREE NEW SCANNERS PLUS A WIDE BAND SCANNER WHIP ARE NEW TANDY ADDITIONS

From Russell Bryant

Every 18 months or so, Tandy clears its shelves of old or redundant stock, in preparation for the arrival of new models and products. This time around, three handheld scanners have been released, plus a magnetic mount scanner whip. The scanners vary from budget to top-shelf gear.

PRO 41

Starting at the bottom, the PRO 41 is first up. The PRO 41 replaces the PRO 38. Any frequency between 68-88, 136-174 or 406-512 MHz can be programmed into the 10 memory channels. Sensitivity is quoted as .3 microvolts for midband VHF (making it ideal for rural areas where midband features prominently), .7 microvolts for VHF highband and .7 microvolts for UHF.

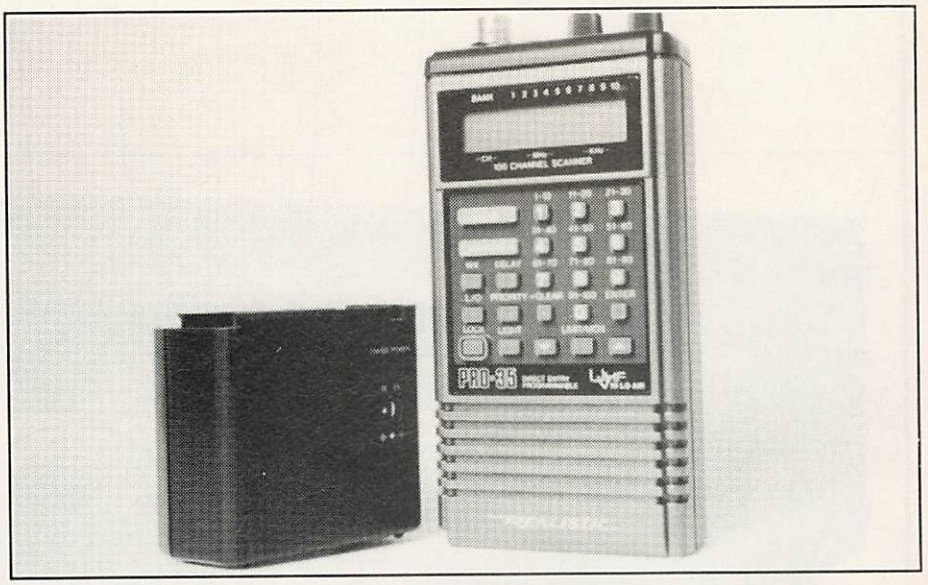
The PRO 41 requires five AA dry cells or ni-cad batteries. Using 500mAH ni-cads a duty cycle of between 8-10 hours scanning can be expected from a single charge. Manufactured by Uniden for Tandy, the PRO 41 employs a 10.85 MHz IF, therefore images are 21.7 MHz above the actual frequency.

The PRO 41 measures 178 X 67 X 35mm and weighs just under 300 grams. If you require a second scanner or have a limited number of services or frequencies you wish to monitor, then the PRO 41 should be considered. **Price for this unit is $249.95.**

PRO 35

At first glance the PRO 35 appears comfortably familiar. The 35 is a synthesised handheld supporting 100 memory channels. Based on the popular Uniden 100 XLT, the PRO 35 can be programmed to receive frequencies in the following bands: 68-88, 108-136 AM, 137-174 and 406-512 MHz.

Sensitivity varies from .5 microvolts on VHF midband up to 1.6 microvolts on the AM aircraft band. The 100 memories are divided into 10 banks of 10, making it easy to organise frequencies into user groups. A standard Uniden IF of 10.85 MHz is also used in the PRO 35.



New PRO 35 features 100 memories and is based on the Uniden 100 XLT.

All functions, frequency information and channels details are displayed on the LCD. Memory back-up is provided by an internal battery, programmed data will be held for at least one hour before drop-out. The PRO 35 is a very durable scanner that impresses the user straight out of the box. **The price is $399.95.**

PRO 37

I would like a dollar for every PRO 34 scanner that Tandy has sold. It has proven to be a very popular receiver. Not wishing to disturb the success of the 34, Tandy has used it as the base for the PRO 37. The 37 is, for all intents and purposes, the PRO 34 with the added feature of HYPERSCAN. Hyperscan was introduced with the PRO 2006 super scanner late last year. It replaces the old and slow scan rate of 16 channels per second associated with the PRO 34, with a 'hyper' speed of 25 channels per second, a near 50 per cent increase.

The PRO 37 comes with the same frequency coverage of the 34, that is 68-88, 108-137AM, 137-174, 380-512 and the increasingly active 806-960 MHz.

The 200 channels are broken up into 10 banks of 20, again making it ideal to divide associated frequencies into easy-to-use banks. Sensitivity for the PRO 37 is given as 1 microvolt to 2 microvolts (at 20dB S/N) across all bands. The PRO 37 has taken pride of place as the top-shelf handheld scanner in the 1991 Tandy catalogue. **Recommended retail price is $499.95.**

MAGNET MOUNT MOBILE ANTENNA

One of the biggest complaints voiced by scanner enthusiasts is the non-availability of a mobile scanner whip that delivers performance across all bands. Due for release at the same time as the portables above is a wideband, (25-1300MHz), magnetic mount mobile whip.

The twin load, stainless steel aerial is designed to provide maximum gain where needed, without compromising other bands. The magnet is designed to withstand high speeds without coming adrift. The whip comes with 5.5 metres of RG 58 cable, long enough for even a semi-trailer. **Price for this is $69.95.**

Three new handheld scanners, plus a wide band mobile scanner whip have been added to Tandy's 1991 catalogue. SCAN columnist Russell Bryant brings you an update.

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"The prang is at fifty six and seventy five, just down from eighty...."

Could you run that past me again, matey!

Tow Truck Frequencies for New South Wales

This issue we are going to target the tow truck industry and examine how these companies make radio work for them. Naturally, what Bob Lopaka article would be complete without a detailed frequency list? And boy oh boy, have I got one for you . . . the largest towing company frequency listing you will find in any publication in the southern hemisphere! These frequencies are only for NSW, as this is my "home turf" but, I know CBA is keen to hear from listeners in other states.

First off, we'll hop into the RV and take a run out to Chester Hill Road in Bass Hill, a southern Sydney suburb and the home of ML Towing, which co-operated in the research of this article. The ML fleet is well known around the area, consisting of seven very nifty tow trucks in immaculate condition, and each one a veritable mini communications station! All are equipped with a Realistic PRO-2020 mobile scanner connected to an external antenna, in some trucks this is a dedicated UHF quarter wave while others have broadband whips. Some of the ML drivers are scanner fanatics, listening whenever they get the opportunity as well as at home on their own radios. Other tow truck drivers simply use scanners as tools, not having a particular interest in radio for relaxation.

The base station in ML Towing's office includes two Uniden Bearcat desktop scanners, which the boys prefer over the Tandy radios. Senior ML driver Bill Stacey personally owns a PRO-36 handheld which he uses whenever the urge grips him to do some monitoring. Not long after our first meeting Bill asks if I can provide the local fire brigade channel. I immediately rattle this off as being 78.070 MHz, and Bill quickly programs it into his PRO-36. "I've been looking for that one," he explains. "We want to pay the firies a bit more attention. Basically we are getting most of our jobs by intercepting the local police channels but, that isn't to say we couldn't get a bit more from the fire channels. We don't see much point in monitoring the ambos, although we do have the frequency".

Lettuce And Bananas?

I was keen to hear how much Bill knew about his competition's radio channels _ and whether they might know about his. It's universally accepted that ALL towing companies know their oppositions' channels and monitor them constantly. For this reason, security is high on the agenda of any towing company, and ML Towing is well aware of the need to prevent competitors "liberating" their jobs from them! Bill Stacey has worked for numerous towing companies. One of his first employers used to make all drivers carry a code book two inches thick, with page numbers and job locations encoded. "It was quite a funny system they had there", he quips. "They only had nine or 10 main streets in the area and each was given the code name of a vegetable or piece of fruit, so you'd hear the base operator call an accident at 'the intersection of lettuce and banana'!"

ML Towing uses a code system also on its on VHF midband frequency, which is a simplex operation. Its messages are worked out using a substitution number code, where a typical message sounds like . . ."the prang is at fifty six and seventy five, just down from eighty!". Simple but effective. I asked if ML would educate us with finer points of its code system. "Hardly," grins Bill. "We all have to eat, you know, and even if we gave 'em to you we'd just change them again anyway. We normally change the codes every few weeks". I did question 'the boss', Michael Lahodiuk, about the callsigns used. "They are just numbers," he said, "Truck 1, Truck 3 and so on."

Various forms of encoding job-related messages are used by towing companies in NSW, particularly in the Sydney metropolitan area, from electronic scrambling (normally of the 'inversion' type), and countless forms of substitution codes similar in basis to that of ML Towing. The use of cellular mobile telephones in the trucks is becoming more and more noticeable. Paging units, mostly alpha-numeric, are standard issue for tow truck drivers around NSW. Frequently you will hear on the towing frequencies something akin to "Dave, turn your pager on!" or "Give me a ring on the mobile phone!". The message is then given in 'clear' or plain language across the pager or when the driver rings in on his cellphone. Very little vital information, if any, is given away on the company two-way frequencies unless the operator is the only towing company in that area and there is no competition to steal jobs. Then the situation is different, and the attitude of personnel on the radio is much more relaxed!

Companies discover their oppositions' frequencies not from the microfiche, not from frequency guides or even CBA (although many towies are regular readers). They are normally found out by word-of-mouth as drivers leave the 'competition' and change employers, taking with them the frequencies they used to work on. Some towing companies monitor scanners for weeks on end, day in and day out, to find a frequency belonging to some new towing firm or one belonging to an existing company which has changed frequencies. Quite a number of towing companies once found on the VHF bands have migrated to UHF in order to avail themselves of metro-wide talk through repeaters.

Tow-truck drivers rely heavily on two-way radio, scanners, pagers and carphones. BOB LOPAKA investigates . . . Naturally, what Bob Lopaka article would be complete without a detailed frequency list? And boy oh boy, have I got one for you . . . the largest towing company frequency listing you will find in any publication in the southern hemisphere!

27 MHz - The Good Oil

David Newton is at present the only ML driver with a cellphone in his truck, and its usage is steadily increasing. Bill reckons it may not be too long before all the trucks have them. But, UHF CB radios are noticeable by

(continued over page...)

their absence in the trucks. In the early days of UHF CB a lot of drivers went up to 477 MHz because it was quiet and there was less chance of the competition finding them among 40 channels. But, nowadays many companies like ML Towing just don't see the need for them. Along with company two-way and scanner the trucks also have 27 MHz CB, usually tuned to the truckies channel. This is where most of the good information stems from. "We keep our ears open on 27 megs," says Bill, "although we don't talk a great deal on it. The truckies say to each other 'look out for the prang down on the highway near Chullora mate, the whole lot of the westbound lanes are blocked'. As soon as we hear that, we're off. Getting to an accident first is like a psychological advantage. Often a driver will award you the job because you're the first there. They have a sense of fair play, and think if anyone deserves the tow you do.

If they wish they can select any tow truck they like, even the last one there, to tow their vehicle away."

Shopping for scanners and otheradio gear is done usually during dealer sales and on an 'as needed' basis. If they don't need one, they don't buy one! The radios are usually installed by Bill or Michael themselves, and it's only if they get a "bad SWR" that they seek more professional help.

Tow trucks are usually on the scene before the police and, in New South Wales at least, they generally have a good working arrangement with the law.

A 24-Hour Job

Everyone working for ML Towing keeps an ear on their scanner so that no job is missed. During office hours, a young lady is employed to operate the base radio and answer phone enquiries, a job with no lack of pressure. At night the drivers listen intently to VKG and the CB channels and rarely miss a call of significance. Even in bed late at night, Michael Lahodiuk continues to monitor, and if a good call comes up he gets on the two-way and tips the drivers that a job is going.

With the police frequencies being the keenest source of accident information, the drivers hear and see some of the goriest scenes that any human beings have to put up with as part of their daily duties. "You harden to it mostly, or get out of the industry pretty quick," says David Newton. Bill Stacey adds that many times his drivers have assisted police when they just happened to be "johnnie-on-the-spot" at some serious occurence. Michael himself caught a bagsnatch offender who was 'decamping' from pursuing police, his public spirit recognised in the local newspaper.

Dave Newton recently arrived at an accident called across VKG as having a 'person trapped' accident, and found no-one hurt. He immediately alerted the ML base and had them ring and inform the police, so cars speeding towards the scene could slow down. "The cops here do a great job," says Dave, "and flying through red traffic lights they're putting their necks on the line. If we can make things easier for them we do. It's a pretty good relationship we have with the police, and they generally try to be fair with us."

If you're from NSW, and you haven't punched in any towing company frequencies on your scanner keyboard, give a few of your local channels a try from this massive list that we now present for your information and monitoring enjoyment! I'm sure you won't be programming them out after you've heard what they have to offer - action, life in the raw, and humor by the barrel load!

BOB LOPAKA'S NEW SOUTH WALES TOW TRUCK TARGET LIST:

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71.390	GRAHAME'S GARAGE,	GLOUCESTER
71.540	CARDIFF TOWING SERVICE,	DUDLEY
72.305	MOBILE SERVICE STATION,	PEATS RIDGE
72.400	R & M MILLS TOWING,	ENGADINE
72.410	ROY PARSON'S AUTO SPARES,	INVERELL
72.440	SJ & EM KENELLY,	TORONTO
72.545	GOROKAN SMASH REPAIRS,	GOROKAN
72.815	HART'S GARAGE	KIAMA
73.160	R.G. PATE SMASH REPAIRS	ST. MARYS
73.190	E.M. BELFORD GARAGE	GRIFFITH
73.415	RUGG TOWING	WARILLA
73.535	CARDIFF TOWING	SUGARLOAF
73.730	SANDY'S TOWING	WARATAH
73.730	GUEST'S GARAGE	WOLLONGONG
73.790	GRANGER'S TOWING	GOULBURN
73.850	A.B.A.L. TOWING SERVICE	THORNLEIGH
73.880	HOLROYD SMASH REPAIRS	MERRYLANDS
74.330	HUGHES TOWING	WENTWORTHVILLE
74.570	ML TOWING	BASS HILL
75.440	BELTRAME BROS. GARAGE	GRIFFITH
75.650	HILL BROS. GARAGE	YETMAN
75.880	CASSIAX TOWING	CARDIFF
76.070	ADVANCE GARAGE	DULWICH HILL
76.160	A. & J. AUTO REPAIRS	PUNCHBOWL
76.520	BROWN TOWING	BRANXTON
76.610	COLONIAL TOWING	BELLEVUE HILL
77.330	BRIDGE'S ROAD SMASH REPAIRS	MOOREBANK
77.330	LIVERPOOL SMASH REPAIRS	LIVERPOOL
77.375	TAYLOR'S TOWING	NARARA
77.375	TUMBI TOWING & SMASH REPAIRS	TUMBIUMBI
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79.090	RANGER TOWING	RANDWICK
80.400	NARRABEEN TOWING	TERREY HILLS
80.400	RIVERINA CRANE & TOWING	WAGGA
80.415	CENTRAL COAST TOWING	LAKE MUNMORAH
80.430	ROBERT RAY TOWING	HORNSBY
81.060	ROYAN TRUCK REPAIRS	NORTH WAGGA
81.060	STURT AUTO WRECKERS	NORTH WAGGA

81.240	CIRCLE TOWING	BEXLEY
81.480	NORTH COAST CRANES	COFFS HARBOUR
81.570	KOGARAH AUTO SMASH	CARLTON
82.200	RAVEN'S TOWING	GRAFTON SOUTH
82.560	CHULLORA SMASH REPAIRS	GREENACRE
82.620	CAMERON GARAGE	KEMPSEY
82.890	GUILDFORD SMASH REPAIRS	GUILDFORD
82.920	TOM CARR AUTO REPAIRS	GRANVILLE
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158.350	A.P. & L. SWAVELY TOWING	BELMORE
159.880	MANLY SEASIDE TOWING	BEACON HILL
160.210	LOVELOCK TOWING	FAIRFIELD
160.300	AUBURN AUTO REPAIRS	AUBURN
160.300	ADAM'S TOWING	MT. ELLIOT
160.345	BUDGEWOI TOWING	BUDGEWO
160.510	AUTOWRECK	BANKSTOWN
160.540	ALLISON TOWING	KOGARAH
162.070	H.M. TOWING	ARTARMON
162.100	ABEL TOWING	MOOREBANK
162.100	MATTINSON'S TOWING	MT. KEIRA
162.370	ALL SUBURBS TOWING	SYDNEY
162.580	MAROUBRA AUTO REFINISHERS	MAROUBRA
162.580	MAROUBRA AUTO REPAIRS	HILLSDALE
162.640	B.F. PANELS SMASH REPAIRS	ALBURY
162.745	KINGSCLIFFE MOTORS	KINGSCLIFF
163.150	A.B.C. TOWING	ENMORE
163.180	WESTMEAD TOWING	PARRAMATTA
163.240	RHODES SMASH REPAIRS	MARRICKVILLE
162.270	FORNER'S TOWING	BANKSTOWN
163.330	ROYAN TRUCK & TRAILER REPAIRS	PENNANT HILLS
163.360	ROCKDALE TOWING	ROCKDALE
163.540	ENGADINE TOWING	ENGADINE
163.840	MIDWEST TOWING	MARRICKVILLE
164.680	MAYFIELD TOWING	MAYFIELD
164.740	EAST COAST TOWING	BONDI JUNCTION
164.770	BRELCO PTY. LTD.	LIDCOMBE
164.770	KAREENA SMASH REPAIRS	MIRANDA
164.800	BAYLINE PUMP & BODY SHOP	MONA VALE
164.890	C. & A. TOWING	PROSPECT
165.070	ZETLAND TOWING	BEACONSFIELD
165.100	TERRACE JAP'NESE SPARE P'TS	RAYMOND TERRACE
165.100	TOWMASTER	LAKEMBA
165.160	PARRAMATTA SMASH REPAIRS	SEVEN HILLS
165.190	B. & S. CRANES	CAMPSIE
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169.360	BLACKTOWN SMASH REPAIRS	SEVEN HILLS
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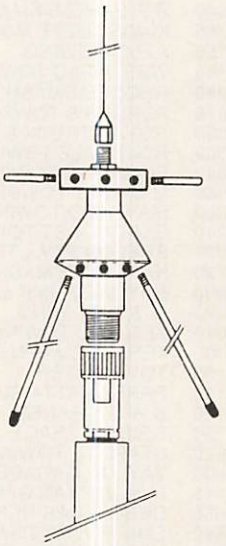
(Test Report in September 1987 CB Action)



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CRYSTAL BALLS WORKS OVERTIME

I get very few calls and letters these days (hardly anyone bothers to let me know what's happening around the place and my crystal balls usually have to work overtime to produce a few lines of scribble for this column) and those I do get are usually complaining about something or someone, but every now and then I hear something which reminds me that there are still a few good CBers out there in RatbagLand.

Such a call followed a road accident between two vehicles out near Warra recently in which eight people were injured, one fatally. Eight ambulances were in attendance along with doctors, nurses, police, and State Emergency Service workers.

Practically everyone in "The Bush" in Queensland has UHF CB and those attending the accident were no exception. They virtually took over the 4/34 repeater for about three hours, even using it to notify the Dalby Hospital about the extent of injuries to those who were being transported in the ambulances so that the required medical treatment could be started without delay on arrival.

Everyone for miles around was listening, of course, and it's to their credit that they left the repeater free while the emergency was in progress. The few callers who weren't aware that anything was going down immediately shut up when advised that the repeater was in use for emergency purposes and there was not one single note of dissent from anyone.

The locals are now trying to raise the funds to install a 5/35 Emergency Repeater in the area.

PORTABLE REPEATER ANYONE ?

Had a letter from Paul, an SES member from Roma, asking for info about a portable multi-channel repeater which could be set up in the boot of a car.

Dunno how DoTaC would like one of these beasties on the loose, but I guess it's possible to make one and I doubt if the SES would misuse it.

Anyone have any ideas ? You can contact Paul at PO Box 220, Roma 4455.

BAROSSA REPEATER STOLEN

Clinton "The Pleb" from South Australia tells me the Barossa Valley repeater isn't getting out too well at the moment .... because somebody pinched it !!

COMMERCIAL OPS ON 5/35

A Brisbane "commercial" UHF-CB group has started using the 5/35 Emergency Repeater on a regular basis. These wankers obviously know they're doing the wrong thing as they don't use callsigns, their transmissions are short and cryptic so they don't give any clues as to their identities or whereabouts and they studiously ignore Emergency Monitors who challenge them.

Time for an attack of The Killer Garden Gnomes !!

GALAHS LOVE A NIBBLE

One of the major problems in maintaining radio communications in country areas is the fact that galahs (the bird kind .... not the human kind we hear calling for spunky YLs on the call channel every night) and cockatoos love to nibble at the outer casing of co-axial cable and I've heard of cases where they've chewed co-ax to the point of being useless in just a couple of days.

Some installers have used "HotFoot" (a chemical which "burns" the birds' feet) with limited success, but it's messy and collects all kinds of airborne dirt and it has to be re-applied regularly to be effective.

A mate of mine who works for a major cable importer has been experimenting with "cockatoo-proofing" co-ax for some time and it looks like he might have finally come up with the answer to the problem .... a bright orange outer casing material which deters the little buggers from nibbling on it.

As a test he put short lengths of standard cable and "Jaffa Cable" (my own name for the stuff) in a cage with a cockatoo. The standard cable was shredded and useless within a day.

The "Jaffa Cable" lasted ten days !!

Not bad going, considering that the stuff was there for the bird to nibble on twenty-four hours a day.

In another test a length was installed on one of the Forestry observation towers near Bauple about six months ago. This was a problem site where flocks of cockatoos were ripping the cable to shreds almost as fast as it was replaced.

It's copped a few nibbles from determined birds, but it's still in use as I write this column.

The "Jaffa-coating" is done locally in small runs on imported Military Specification RG-213 and adds about 1.20 per metre to the price.

While there's no guarantee that "Jaffa Cable" will stop every cable-nibbling parrot in Australia from doing its thing it certainly looks promising so far.

SIGH OF RELIEF WAS WASTED

Brisbane Bad Buddies heaved a collective sigh of relief when the dreaded Garden Gnome left DoTaC and went to live in the USA.

You want the bad news ?

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by Patrick McDonald

ALL ABOUT COMMUNICATION RELATED COMPUTER PROGRAMS

Thanks for picking up this magazine, kind and nosey reader! And thanks even more for browsing this ever-so-humble column. I'll bet you've got a computer, a modem and a radio of some sort at home. Am I right? Yes? No? Well, if you do in fact want to learn more about using your computer in conjunction with your radio you've certainly turned to the right page in this illustrious mag. And if you aren't lucky enough to possess a selection of these supremely addictive electronic gizmos, why not read on anyhow? You might find a bright new interest in your life!

Okay, enough of this confounded silliness. Let's get started and look at some of the latest and greatest new software that has arrived recently at the Shortwave Possums BBS via landline, satellite and modem from far over the sea. The programs this issue are all generic IBM-compatible stuff running under the MS-DOS system which so many computers are using nowadays.

One For The Scanner Buff

Radio databases seem to be the order of the day and the latest version of the program SCANBUF (release 3.65) has been a popular 'download' from my system since it showed up here in Sydney last month.

In fact, SCANNER BUFF! (to give the program it's full name) has been such a success among radio folk in the US that it has been proposed as the nationwide standard for exchanging radio database info, which was one of its original goals when it was first created some two years ago. Author Robert W. Ricci says "SCANNER BUFF! is for you - if you are a person that enjoys sitting for hours listening to police and fire calls, chasing covert low frequency 'numbers' stations, listening in on the shortwave bands, and even amateur radio."

And Ricci has indeed crafted an easy-to-learn, multi-capability database program that allows you to catalog beaucoup radio frequencies. You may have as many frequency loggings or 'records' as you like, only limited by your disk space. This new version also allows you up to 64k worth of comments per record, more than any other similar program.

SCANNER BUFF! is intended for use by those that actively monitor the VHF/UHF bands, but may also be used for just about any other kind of radio monitoring. The program is able to use either CGA color or monochrome screens and may be run with or without a hard drive, though the latter sure does make things easier and faster. Useful features include: searching by agency, by frequency, by callsign, or by displaying all records to the screen; editing, adding and deleting individual station records; printing lists of data to any IBM graphics printer based on agency name, frequency, or callsign; searching for any special police or fire codes you have placed into the code database; and cloning empty database files with new names, a method which enables you to have separate data files for different needs, such as a police-only file, fire-only and so on.

You can also set up the SCANNER BUFF! database to start up in any configuration you want and can call up a 'Groups' selector, which means to set a filter so that only records belonging to a specific type of service are accessed. This is an extremely useful and powerful feature to say the least. As well, there is such a degree of online help built into SCANBUF that the author says the included documentation is not really needed!

Finally, Ricci has configured the program to allow you to shell out to DOS. This is very handy if you want to quickly access DOS function without having to start up the SCANBUF database again... a good idea!

Don't Just Log - HYPERLOG!

Now let's investigate another, but quite different, radio database program, this time designed by US ham Joe Spear especially for the amateur radio operator. HYPERLOG is a logging program designed to make life easier for the busy ham by organizing contact, DXCC and other info and displaying it when needed in an easy-to-read format. The program also provides previous contact retrieval using a very fast tree-indexed search technique and displays these contacts, eight at a time, in a paged window on the main HYPERLOG screen. If you're into ham radio, and know how messy a logbook can become after just a few months of hectic activity, let alone a few years, you can already imagine how useful HYPERLOG might be.

But there's more! Bearing and distance details are provided by decoding the prefix of the call sign to determine the country or US state of the station you're working. HYPERLOG then looks up the correct latitude and longitude coordinates in a table, and these coordinates as well as your local coordinates are fed into a 'Great Circle' calculation routine to obtain bearing and distance information. Real neat, huh?

The algorithm used to decipher the call sign is quite sophisticated and uses international call sign allocations as well as standard prefixes in order to correctly identify the country. As a result, unless the station being worked is using a call sign prefix that is assigned to another country or state (as is sometimes done by special event stations), HYPERLOG will correctly identify the state or country. In the event a misidentification does happen, you can quickly pop up a little window in HYPERLOG and scroll through a list of countries and states until you find the one that fits the unusual station being worked.

The program also provides several windows of statistics on the 'Worked/Confirmed' status of countries as well as country and US state totals by band, mode and mixed mode totals for all 16 bands and 8 modes. By having this information immediately available with the press of a key or two, you can quickly determine if you need a particular country or state for an award or endorsement while tuning around the amateur bands.

A built-in 10-minute timer with on-screen countdown clock is a clever HYPERLOG feature. Now you don't have to wonder when you last gave your callsign: the clock will always notify you with an alarm when it is time to give your mandatory ID.

A final nifty feature is the 'Net/Roundtable' mode. This feature allows you to tell HYPERLOG to start recording call signs, name and QTH data

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from the contacts you enter and display this in a scrolling window on-screen. This lets you easily keep track of check-ins if you are a net control station and provides an easy-to-see reference as to who is participating in a 'roundtable' discussion. These contacts can be sorted by callsign or QTH for your convenience. Simple mono monitors will work with HYPERLOG, but the program also makes full use of state-of-the art VGA VDUs. And it's quite easy to set up, with its special installation program: you simply enter your location, time difference from UTC, callsign, and a few other details when prompted, and off you go!

Whew! This guy has sure spent a lot of time on this software and he obviously knows just what an amateur operator needs.

Testlog

Looks like this ONLINE features stuff mainly for radio hams, coz I have turned up yet another amateur program, designed by US ham Forrest Hudspeth. This package, TESTLOG, is a real-time amateur radio contest logging program suitable for almost all types of contests. It's not a casual logging program like HYPERLOG, as it won't allow duplicate loggings to be recorded and only permits a small report entry. So you can see that the primary intent of the software is lightning speed and convenience, with the one-person operator probably finding it most useful. Many 'big-gun' contest operations have proven that it is wisest to follow the old advice to work 'em all now and sort 'em out later. TESTLOG can thus help eliminate much of that unnecessary QRM and artificially high contact rate by showing which stations have already been logged in the heat of the contest.

In order to have a successful logging operation, you must turn in a completed dupe-sheet or a sorted log/list of callsigns. TESTLOG will log a callsign and an optional report to support a contest station. The primary intent is to be a real-time logger, but it can be used to de-dupe your logs after the contest. Each band and mode combination is logged as a separate file, each of which can contain up to 4000 stations. Duplicate receptions can be found and rejected in under two seconds with special sound prompting tipping the operator with a characteristic beep. If desired, a printed log of each contact can also be generated immediately as it is logged, along with any error corrections. An associated utility program, TESTUTIL, is also available to format a report suitable for submission to the contest authorities.

Another interesting feature is that TESTLOG has been run successfully under the 'Double DOS' environment, allowing two programs to run simultaneously on one computer. So this program is great for operations where the total participants are at a minimum. One person can very easily handle both logging and operating with this program.

I could waffle on and on with more details, but I think TESTLOG is a bit 'esoteric' for non-hams, and those who need such a beast will understand what I have been talking about. Like the others mentioned earlier in this column, TESTLOG is a 'shareware' program. This means you are free to use it free for test purposes. Shareware protocol is that you should properly register shareware programs with the author if you plan to use them regularly, and send the hard-working bloke the small fee he requests. This will ensure that software authors continue to use this non-commercial distribution method that helps us all get cheap and useful radio programs.

Latest on OMEGA

Now, gentle readers, I have continued to receive quite a few messages, mainly of the electronic variety, enquiring about the state of development of the legendary OMEGA database project. This effort was intended to provide an interactive database that could be accessed while connected to a BBS, and if you read David Flynn's preview of the program two issues back you'll be eagerly awaiting the final release of OMEGA. The sad truth is that since relocating house and home to Melbourne author and project developer Rick Jones has still not returned to the BBS world, as was hoped earlier this year. Several other enthusiasts are interested in furthering the project, however, and we'll keep you posted on future happenings.

OK, gang, it's the end of the line for ONLINE, and time to 'drop carrier' until the next issue of CBA. If you want to get in touch with me, to 'download' the aforementioned radio files, to ask questions, or to participate in radio discussions with eccentric wavelength buffs worldwide, simply get your PC to call the ***Shortwave Possums bulletin board on (02) 651 3055 - open 24 hours day!***

Or, if you really must, write to PO Box 357, Round Corner NSW 2158. I will do my best to help, as time permits, especially if you enclose return postage and/or a 5.25" floppy disk (if appropriate). In the meantime, watch out for those power surges and keep in touch...

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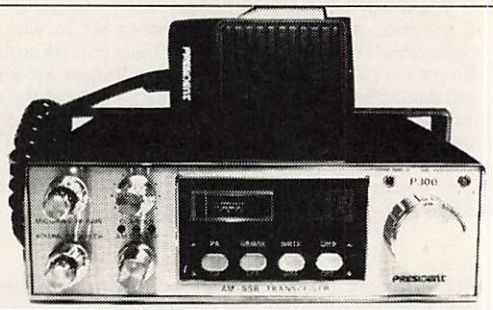

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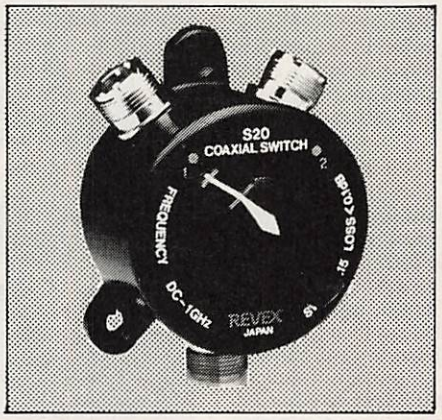

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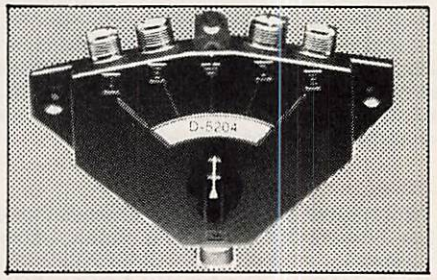

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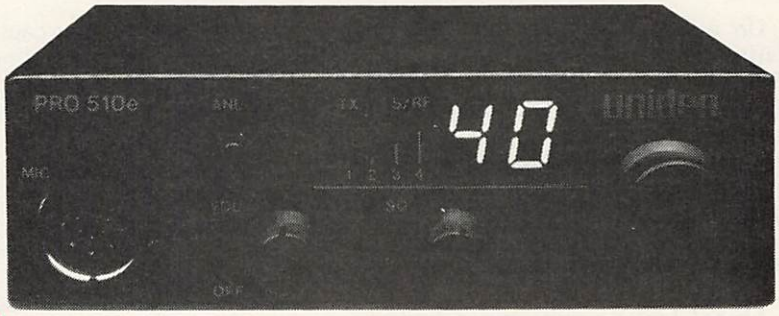

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Get Your Head In The Clouds And Become An...

ARMCHAIR AVIATOR

On a sunny day in July 1959 my father took me to Sydney's Kingsford-Smith Airport to see the first Qantas Boeing 707 arrive in Sydney. After witnessing the arrival of this long and majestic cruiser, proudly bearing the registration of VH-EBB, we went on a tour of the international terminal building, where the Australian Airlines domestic terminal now stands.

I recall looking with awe at the large signboards and their string of far-away destinations serviced by the Qantas fleet of Lockheed Constellations. I clearly remember one signboard listing "Nadi" as a port-of-call on the way to Honolulu, and immediately my mind conjured up thoughts and sounds of a tropical island paradise.

I knew that that the aircraft and towers were fitted with two-way radio and it entered my head at the time that it would be wonderful to hear what the pilots and controllers were saying to each other. It occurred to me that this would be the closest thing to actually riding the flightdeck as part of the aircrew, or being in the tower cab as a controller. I remarked to my father, "wouldn't it be wonderful to own a radio which would allow you to listen to all this, Dad"? He agreed, and then the topic of conversation changed to something a little less dreamy. Airband radios were unknown to enthusiasts in those days and only a handful of licensed ham radio operators seemed to have acquired the few military surplus receivers capable of tuning into aircraft transmissions.

Little did I realise that in a few short years, with the assistance of mass-produced and cheaply priced radio receiving equipment, I would one day be monitoring aircraft both at home and right around the world; private flights, commercial jets and miltary craft, trainee pilots on their first solo and experienced masters of the sky bringing the Concorde back down to earth.

Occasionally I am asked what it is that I find so exciting about listening to large airliners in particular, and aircraft in general. A senior Qantas captain tells me that he cannot understand how anyone could find aircraft communications interesting enough to regularly listen to. Well, I know many airband listeners whom I like to think of as "armchair travellers" or "armchair aviators", and some even follow the progress of airliners on charts and maps as they make regular position reports over radio.

From Fokkers to FA-18s and Cherokees to Concordes, the VHF/UHF airbands are full of variety and action... Bob Bell, Australia's leading "aeradio" expert, tells how to let your ears have wings!

This certainly makes the whole business of listening to aircraft radio just that much more exciting. ABC Radio's Margaret Throsby once enquired of a former captain of the de Havilland 82, from Qantas' bygone days, if he was going to Sydney Airport to see the arrival of the airline's record-breaking 747-400 flight (London to Sydney non-stop in 20 hours). "No", the old timer replied, "but, I'll listen to them report in regularly on their aircraft radios...that will be just as satisfying!"

Believe me, aeradio provides some of the most fascinating and exhilirating listening for the modern monitor.

So, if your scanner has never wandered from the 468 MHz police band or the local emergency services, why not dial up the VHF/UHF airbands...and join the growing ranks of armchair aviators.

Where to listen

For the uninitiated, aircraft use three radio bands. When close to airports and/or over land, civil aircraft use VHF and the military use UHF. Every aircraft travelling oceanic routes has to use HF to remain in voice contact with ground stations. HF air allocations are found between 2805 kHz to 23350 kHz and Rob Williams gave an excellent rundown on HF aeradio in the July/August issue of CBA, so this time we'll time we turn our attention towards bands above 30 MHz.

It is often said that the VHF airband lies between 108 MHz and 136 MHz, however, this is divided into two seperate allocations. 108-117.975 MHz is the VHF air navigation band while the actual communications segment extends from 118 MHz to 135.975 MHz. These are our Australian limits, the USA having an extra one megahertz on the end of this band which stretches it to 136.975 MHz. Transmissions are made on AM, not the FM mode which is more common throughout the rest of the VHF spectrum.

The UHF military air allocation lies between 225 MHz and 399.975 MHz and is also AM.

What might you hear on VHF? There are navigation aids such as ILS (instrument landing systems) and VHF Omnidirectional Ranges (VORs); Automatic Terminal Information Services, best known as ATIS, and more recently at major airports you can log computerised or C-ATIS; plus of course there's all air-ground communications traffic. Transmissions are comparitively short range in nature, with 220 nautical miles being the approximate maximum range with the aircraft near to 39,000 feet (FL390). Communications on VHF are single frequency simplex, that is, both stations transmitting and receiving on the same frequency. The use of remote stations allows some very long distance VHF listening to be done, with upwards of 600 nautical miles quite

common nowadays. Remote systems work by uplinking domestic VHF signals to the Aussat satellite which then beams the signal on microwave to a wider area where it can be received and cross-patched in with another local frequency. As a listener at the other end of the communications chain, you can be in Adelaide or Sydney yet still hear airliners reporting from Central Australia!

Military Aeradio

UHF is pretty much the same as VHF with its line-of-sight properties and this is the domain of military aircraft. There aren't all that many scanning receivers which cover the military UHF segment, but, that doesn't really concern the casual listener as most military UHF is rebroadcast on the civil VHF band so that everyone up there knows where everyone else is within their airpspace. Many RAAF airfields categorise their commonly used radio frequencies into channel presets called "studs". Each frequency is given a number and set to that position on the radio. So instead of saying, "call ground on 264.6", the controller may say, "call ground, stud 2!"

For a fuller briefing on monitoring the military I highly recommend Bob Lopaka's excellent two-part series "Military Action" which appeared in the Jan/Feb and March/April 1991 editions of CBA.

Airband scanners

Most mid-range scanners from Realistic, Uniden-Bearcat, AOR, Cobra, Yupiteru and Fairmate will receive the VHF airband. For UHF military listening you should look for a model with "continuous frequency coverage" which covers the 225-240 MHz band. There are plenty of good second-hand models around and if you are in the market for new gear then shop around and don't be afraid to try and drive a bargain, you may pick up some very keen prices.

Air traffic control

There are two defined regions of "airspace" - CTA is "controlled airspace" while OCTA is "out of controlled airspace". Air traffic control or ATC personnel talk by radio to pilots operating in CTA, actively controlling aircraft movements of the aircraft so as to prevent traffic conflicts. There are controllers for Tower, Surface Movement, Departures, Approach, Sector and Operations. All have unique jobs on various radio frequencies. Most are easily identified by callsigns used such as Brisbane Control (sector), Melbourne Approach (approach), or Sydney Ground (surface movement).

Sector controllers look after the high level airways, the aerial "highways" if you like, and the frequencies they use are a particular favourite of mine. Very remote sites are frequently patched into these channels and some long-distance listening can be achieved from your monitoring post. Some monitors love to listen to just the Approach Control in major cities where they live, due to the heavy workload and stressful circumstances the controllers have to work with. Aircraft in Controlled Airspace are assigned separate operating altitudes or flight levels unless they are more than ten minutes minimum flying time apart and flying in the same direction.

Aircraft on the same track flying towards each other, or converging from another track, will never be given the same altitude.

Flight Service

Flight Service provide services similar to Air Traffic Control but, they conduct their business with pilots operating OCTA. The pilots conduct their flights on tracks laid down in accordance with set procedures. They choose their own operating altitudes and the Flight Service Officers keep them updated on the relative positions of other aircraft that may conflict so the pilots can adjust their track or altitude to avoid any problems. Melbourne Flight Service identifies simply as "Melbourne" and Adelaide Flight Service as "Adelaide". On these frequencies you will regularly hear direct communications between two aircraft, passing details of each others' relative position so they can build up a picture of each others' relative position. One pilot may elect to track "coastal" while the guy talking to him says he will fly "further inland" to enable them to remain separated. Sometimes these aircraft will be at the same operating altitude and it is up to the pilots, with Flight Service assistance, to avoid collisions.

Where is the line between CTA and OCTA?

Near airports, controlled air extends from the ground up, but, as you get further away from the airports, the lower altitudes such as 2,000 or 3,000 feet are designated as "uncontrolled". Just above these areas of low level OCTA airspace the high level controlled airspace starts again, increasing in steps like a staircase until it finishes at 45,000. Unlike the fairly free-and-easy system in uncontrolled air, aircraft in controlled airspace are very rigidly supervised and no deviations from the instructions are permitted without prior approval. This way, there is no room for misunderstandings or errors.

Plane Talk

All aircraft communications use the phonetic alphabet, the planes themselves signing with the last three letters of their registration. Imagine what would happen if VH-ABM and VH-ABN were airborne on the same radio frequency and in the same area. If we simply called them "ay-bee-em" and "ay-bee-en" there would exist the serious possibility that one aircraft may mistakenly act on instructions given to the other... a mistake which could prove fatal. But, the callsigns "Alpha Bravo Mike" and "Alpha Bravo November" sound very different and eliminate this problem.

To create a glossary of aeronautical terminology for the serious airband listener requires many pages... too many to be included in this introductory article. However, we will look at the most frequently monitored and most-confusing aeronautical words and phrases. This will assist you in not becoming "bogged down" within the hobby before you get a real chance to start.

We'll leave alone the commonsense terms and highlight those harder ones which can't be easily guessed!

Airspeed	speed through the air in knots
Airway	path for aircraft to track
APU	auxiliary power unit
ATIS	automatic terminal information service
Aussie	callsign for RAAF when flying internationally
Block	altitude clearance with upper/lower limits
Cat	clear air turbulence
C-ATIS	computer-atis
CAVOK	(pronounced "KAV-OKAY") cloud ceiling and visibility better than prescribed conditions
DME	distance measuring equipment
FIR	flight information region
FIS	flight information service
FRM	for routine maintenance (Qantas term)
GCA	ground controlled approach (military)
Go Round	aborted landing (missed approach)
Groundspeed	speed over reference point on ground
Heavy	American term - aircraft of or above the weight of a Boeing 707
Hold	pattern flown while awaiting approach
IFR	instrument flight rules
ILS	instrument landing system
IMC	instrument meteorological conditions
INS	inertial navigation system
Kiwi	callsign of Royal New Zealand Air Force
MAC	US Air Force Military Airlift Command
Met	meteorology
Nosar	no search-and-rescue watch equired
OCTA	outside controlled airspace

ARMCHAIR AVIATOR

(Continued...)

OKTAs eighths of sky covered by cloud (eg. 2 oktas = two eighths of the sky)
Omega low frequency navigation system
On Top aircraft cruising on top of cloud
Orbit similar to holding pattern
Pax company term meaning passengers
P-O-B persons-on-board (usually passenger figures only)
QNH altimeter sub-scale setting for reading altitude
Reserves minimum fuel figure required on arrival
RPT regular public transport
RVR runway visual range
Shear sudden change direction & speed of wind
SID standard instrument departure
Sigmet plain language weather message
Souls on board total headcount on board (pax + crew)
Speedbird Callsign of British Airways
Squawk code transponder code identifying aircraft on radar
STOL short takeoff and landing
Stud military airfield frequency resets
TACAN military tactical aerial navigation
Uniform UHF radio transceiver military)
U/S unserviceable
VASI visual approach slope indicator
Victor VHF radio transceiver (military)
VMC visual meteorological conditions
Zulu universal co-ordinated time (gmt)

Company radio

These private two-way channels are equally important to the operations of airlines as is air traffic control. There is a great need for airliner crews to talk to their company regarding a variety of operational matters and they keep in touch with their company even when they are thousands of nautical miles away in foreign lands. When inbound to their destination, airliners call with maintenance matters and special passenger requirements such as wheelchairs and rental cars. Qantas refers to this traffic as "FRM" meaning "for routine maintenance". Hijack situations frequently show up on company frequencies as police agencies and their anti-terrorist brothers attempt to set up communications with the baddies to bring the situation to a speedy end. Experienced aeradio buffs know that some of the most engrossing and intriguing monitoring is to be found on company frequencies, located between 128 and 136 MHz. So put your scanner into "search" mode and go for it!

To get you started, here's a list of main frequencies at primary Australian airports. There are many more channels out there, but, this will make a tasty entree for you. Bear in mind, that like other services the airband allocations are not carved in stone, they can and do change from time to time. This list was accurate at the time of writing (May 1991). I've also listed the runways of each airport and for those who don't know how these things work, the runway "number" is a shortened form of the bearing in degrees from north, eg. runway 21 is 210 degrees. Some runways are also marked as centre (C), left (L) or right (R).

ADELAIDE

Runways	05/23
FIS	120.7, 122.4, 123.4, 123.9, 124.1, 125.9, 360.8
APP/DEP	118.2, 124.2, 255.3
TWR	120.5, 281.4
SMC	121.7
ACD	126.1
CONTROL	125.3, 269.6, 127.1, 135.0, 128.1, 132.8, 131.8, 132.9, 135.4, 132.7; 128.6 and 306.3 for RAAF Edinburgh
ATIS	116.4, 362 kHz

ARCHERFIELD

Runways	10L/28R, 04L/22R, 10R/28L, 04R/22L
TWR	118.1, 123.6
SMC	119.9
ATIS	120.9, 419 kHz

BANKSTOWN

Runways	11R/29L, 11L/29R, 18R/36L,11C/29C,18L/36R
TWR	132.8, 285.4, 123.6
SMC	119.9
ATIS	120.9, 416 kHz

BRISBANE

Runways	01/19, 14/32
FIS	119.5, 120.3, 121.2, 123.9, 125.7, 126.0, 126.8, 379.5
APP/DEP	124.7, 125.6, 269.3, 281.4
TWR	120.5, 335.6
SMC	121.7
ACD	118.6
CONTROL	125.2, 130.0, 134.2, 118.9, 360.7, 127.2, 338.3, 130.4, 350.2, 123.0, 322.4, 132.0, 133.4, 133.8
ATIS	113.2, 125.5

CANBERRA (FAIRBAIRN)

Runways	17/35, 12/30
APP	124.5, 335.6
DEP	125.9, 306.3
TWR	118.7, 257.8, 243.0, 263 kHz
SMC	121.7
ACD	121.7
ATIS	116.7, 263 kHz

DARWIN

Runways	11/29, 18/36
FIS	122.3, 124.1, 122.6, 124.9, 285.4, 338.2
APP/DEP	120.5, 134.1, 363.8, 243.0, 305.4
TRAFFIC	123.0, 261.4
TWR	118.3, 257.8, 243.0
SMC	121.7, 119.0, 264.6, 259.8
SMCV	119.0, 121.7, 259,8, 264.6 (ground vehicles)
ACD	126.8, 236.1
CONTROL	123.8, 285.4, 129.2, 340.2, 317.7, 133.8, 134.0, 134.4, 133.7
ATIS	113.7, 316.2, 308 kHz, 344 kHz

ESSENDON

Runways	08/26, 17/35
APP	319.2, 124.7 (Melb.)
DEP	360.7, 118.9, 129.4 (Melb.)
TWR	125.1, 129.8 (city use-linked to 125.1)
SMC	121.9
ACD	127.7 (Melb.)
ATIS	119.8, 356 kHz

HOBART

Runways	12/30
FIS	122.1
TWR	118.1, 255.2
ATIS	112.7, 124.4

JANDAKOT

Runways	06/24, 12/30
TWR	118.1
SMC	119.9
ACD	133.0 (Perth)
ATIS	120.9, 281 kHz

LAUNCESTON

Runways	14/32, 18/36, 11/29
TWR	118.7, 281.4
ATIS	112.6, 242 kHz

MELBOURNE

Runways	16/34, 09/27
FIS	118.6, 120.0, 121.3, 124.0, 122.4, 124.9, 125.9, 125.8, 126.8, 263.0
APP	124.7, 135.7
DEP	118.9, 129.4, 360.7
TWR	120.5, 322.4
SMC	121.7, 121.2
SMCA	121.2
ACD	127.2, 121.7
CONTROL	126.6, 317.4, 123.6, 128.5,

	125.5, 127.0, 130.3, 135.3, 127.4, 125.7, 338.2, 131.0, 130.5, 269.3, 118.2 (Point Approach), 131.3 (Point Approach), 243.0, 258.2 (Point Approach), 285.4 (Point Approach)
ATIS	114.1, 132.9

MOORABBIN

Runways	04/22, 17L/35R, 13L/31R, 17R/35L,13R/31L,18R/36L
TWR	118.1, 123.0
SMC	119.9
ATIS	120.9, 398 kHz

PARAFIELD

Runways	03L/21R, 08R/26L, 03R/21L, 15L/33R, 08L/26R, 15R/33L
TWR	118.7, 124.6
SMC	119.9
ATIS	120.9, 416 kHz

PERTH

Runways	03/21, 06/24, 11/29
FIS	119.8, 120.0, 120.7, 121.2, 121.7, 122.4, 123.4, 123.9, 124.8, 125.4, 125.7, 269.4, 317.7
APP/DEP	118.7, 123.7, 126.6 (Radar), 360.7 (Radar), 355.0
TWR	120.5, 269.3, 400 kHz
SMC	121.7
ACD	133.0, 128.1
CONTROL	127.3, 132.0, 133.5, 134.0, 130.9, 133.2, 133.6, 133.7, 134.2, 125.0, 130.1, 132.8, 133.4, 134.5, 125.2, 360.7
ATIS	113.7, 272 kHz

SYDNEY

Runways	16/34, 07/25
FIS	121.1, 121.2, 121.6, 124.1, 125.8, 124.6, 124.8, 125.0, 125.7, 314.6, 269.6
HELICOPT.	120.8 (lane frequency - unstaffed)
APP	124.4, 126.1, 307.8, 281.5
DEP	123.0, 125.3, 263.6, 285.6
TWR	120.5, 279.5
SMC	121.7
SMCA	122.3
ACD	127.5, 121.7
CONTROL	130.9, 319.8, 126.9, 360.6, 335.5, 385.5, 127.0, 130.1, 125.6, 317.5, 128.4, 128.6, 384.5, 135.9, 363.8, 243.0, 119.7, 328.5, 269.0, 306.0, 129.2, 129.8, 319.9, 118.4, 81.5, 127.3, 269.1, 131.3, 342.9, 118.5, 306.1, 128.2, 253.5, 123.4, 350.3 (Freq's 135.9, 363.8, 119.7 and 328.5 for Richmond Approach)
ATIS	132.7, 115.4, 317 kHz

Major company frequencies (Search between 128 and 136 MHz to find your local company channels)

119.1	Fuel trucks/clubs
122.7	Gliding
122.9	Gliding, Parachuting
123.45	Ballooning and unoffical air-to-air
125.5	East-West
126.35	OCTA air-to-air
126.4	East-West, Flight Facilities, Hazelton, Kendall
126.7	Qantas simulators
128.8	East-West
128.95	Controlled airspace air-to-air
129.25	Compass
129.5	Australian
129.85	Singapore Airlines, Lufthansa, Continental
130.0	Thai International, United
130.2	Olympic
130.6	East-West
130.65	Ansett
130.96	Ansett
131.1	Air India, UTA French Airlines
131.2	KLM, Lufthansa
131.25	Qantas Corporate Services
131.4	United
131.5	Continental, Qantas training
131.6	Police Airwings
131.65	Eastern Australia Airlines
131.7	Qantas
131.8	Japan Airlines, Cathay Pacific, Singapore Airlines
131.9	Qantas, Alitalia
132.65	Australian
132.95	Cathay, Olympic

Where To From Here?

If this first brush with the workings of aviation radio has fired your enthusiasm and you want to know more, allow me to plug "The Australian Airband Guide". It has 181 pages jam-packed with aeradio information you can put to use from the minute you open the book and turn on the scanner. It so happens that I wrote this book ,but, the fact that it has almost sold out around Australia speaks for itself.

The cost is $24.95 (include $3.00 pack & post) from Airband Communications, PO Box 301, Chester Hill 2162. You can even pay by Bankcard, Mastercard or Visa if you prefer!

One thing I am certain of...you will have an absolute ball using your radio to monitor aeronautical traffic across this nation!

But, be warned - this bug bites hard and once you're "hooked" airband monitoring can be a terminal disease!

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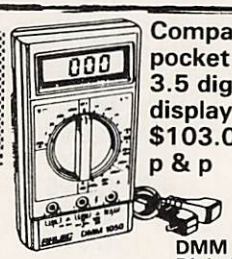

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For the "Top Gun" DXer...

Kenwood R-5000

Rob Williams takes a look at Kenwood's flagship communications receiver.

Kenwood has always been up there at the top of the receiver market with "state-of-the-art" tuners well equipped to meet the demands of any DXer. The R-5000 continues Kenwood's reputation for high quality gear. It's full of enhancements and capable of extending your listening well past what you have been used to and into a new world, a sort of "third dimension of DX".

More Radio For Your Money

Early R-5000 units shipped to Australia only tuned 2 MHz - 30 MHz, however it now comes fitted with the full compliment of bands from 30 Hz through to 30 MHz.

The R-5000's greatest strengths are the twin VFOs and 100 memory channels, so let's look at these first. Having two VFOs at hand is like having two radios in one - you can listen to your favorite station on one while using the other to tune around the bands. Yet with the push of a button you can flick between the VFOs. I often use the second VFO for listening to parallel broadcast frequencies.

Six switches located below the mode keys are used to control VFO and memory operation. Entering frequencies is easy. Let's say you want to tune to 13277.86 kHz. Hit the ENT key, then enter "1327786". There's no need to enter a decimal point and the CPU in the radio is smart enough to know that the 6 is the last number. Unfortunately when selecting a frequency below 10 MHz you must enter a zero to begin with, a procedure which takes time and patience to get used to it.

The R-5000 then allows you to choose which mode you want, using the same set of keys. By allowing digital accuracy to within 10 hertz you can resolve even the tightest CW signals and check for transmitter drift, which is common with many Asian and Latin American stations.

The memories are grouped in 10 banks of 10 channels apiece, allowing you to lock in or out any bank when scanning. A back-up battery is used to keep the microprocessor powered up and store the memories. Once the battery is fully charged it should last about 10 days if you lose AC power.

Scanning Should Suit Everyone

There are two scanning options. The factory default is "time operated scanning", where the radio stays on each channel for about five seconds before moving to the next one. With some assistance from an authorised Kenwood dealer the radio can be set up to work like a normal scanner, only remaining on a channel when a carrier is present. We all know how noisy it is on HF so using "time operated scanning" seems to overcome these problems. However, it does mean that if you hear a signal you want to listen to, you'll have to manually intervene before the R-5000 goes racing ahead.

There are also two memory scan modes. The first allows you to scan any or all of the 100 memories, while in "program" mode it will search between two frequency limits stored in channels 8 and 9 of each bank, and store active channels once in that bank.

You can enter frequencies into the memory from either VFO so they can be recalled at the touch of a button. The R-5000 gives you the added advantage of being able to program into any memory channel the mode and either of the two antenna sockets to be switched in-line. So selecting a ute channel might automatically switch the receiver to USB and select your tuned trap aerial. Unfortunately Kenwood hasn't yet extended this to include other controls such as squelch or selectivity but, we do hope it's working on it!

The fluorescent digital display is full of information. It clearly shows frequency, memory channel, time and either VFO A or B. Reception modes are indicated by small LEDs inside the mode keys, located on the right hand side of the radio. These double as frequency entry keys for the VFOs and memories.

An annoying feature, about which many R-5000 owners have complained, is the "beep" emitted whenever you operate a mode key. You can't turn it off or even down. Great for visually impaired Dxers but, Kenwood should give you some control over it.

The two built-in clocks are very handy, the most obvious use being to set one to local time and the other to UTC. Like earlier Kenwood models, the R-5000 allows you to turn a tape recorder on or off at a preselected time. I relied heavily on this feature on my old R-1000 and was delighted to see this feature incorporated in the R5000. Without it I would be lost. It's getting harder these days to find time to sit down and listen to live DX programs or your favorite radio show, especially when your wife wants you to help out with the household chores.

One For The Traditionalists

Kenwood's selection of an analogue meter rather than a digital display will please many old hand DXers. While a row of flashing lights looks impressive my own preference is for these old-fashioned meters. The large, black, main tuning dial in the middle of the

Have you ever walked past an electronics shop, looked in the window and seen a radio you MUST have? You know you can't afford it but hope one day you will, and you decide to start saving there and then, week by week, until that radio is yours! The R-5000 is such a radio. It may be a bit on the expensive side but it has all the latest features for better DXing.

front panel is ideal for very small incremental frequency changes. I found it very easy to resolve SSB signals. The dial "drag" can also be changed to suit the individual while tuning speeds can be varied by use of the mode and the step switch

On the right side of the front panel are what I call the "enhancement controls". These allow you to vary many of the receiver's more specialised characteristics to snare an even better signal, and they're the sort of features which separate top-class radios from more mid-range units. On the R-5000 this include a variety of filters, noise blankers and selectivity controls.

Choice Of Filters

When looking for a good HF communications receiver both for broadcast listening and utility monitoring you need sharp filters for both modes. Selectivity on the R-5000 can be varied to suite your own requirements, with the choice of five different settings. The basic model has a 6 kHz "wide" and 2.4 kHz "narrow" filter. To improve your broadcast DXing you can fit the optional YK-88A-1, which while it is still a 6 kHz filter it has a better "shape" factor for sharper selectivity. But, at $80 it doesn't come cheap. There are also optional filters designed specifically for CW and RTTY work. Yes, it's good to have this choice of filters but, I think Kenwood could have given us a better selection for shortwave. 2.4 kHz is really too narrow for broadcast stations, even though it's very good for SSB, and around 2.7 kHz would have been ideal. And while the optional 6 kHz filter improves the situation it would do so even more if it were narrower too. In FM mode, selectivity is fixed at 12 kHz. The "auto" selectivity mode allows the R-5000 to set the IF bandwidth for optimium reception.

You're probably thinking that all this is way above your head and if all you want to do is some shortwave listening then this stuff doesn't really matter. Well you'd be wrong, because things like filter specifications affect your day-to-day listening. A good example of this is when I was monitoring Radio Moscow on 11690 kHz. Just 1 kHz down, on 11689, was an RTTY station which while not as strong as RM was still annoying. By switching the selectivity into narrow I was able to cut out the RTTY signal but, it also made it harder to listen to Radio Moscow clearly.

Several R-5000 owners have complained that the unit tends to run very hot. After operating the radio for several hours I found that the radio case does get warm, but only as much as other consumer electronics goods found in the home. If you are worried about this then make adequate room for ventilation at the back of the radio.

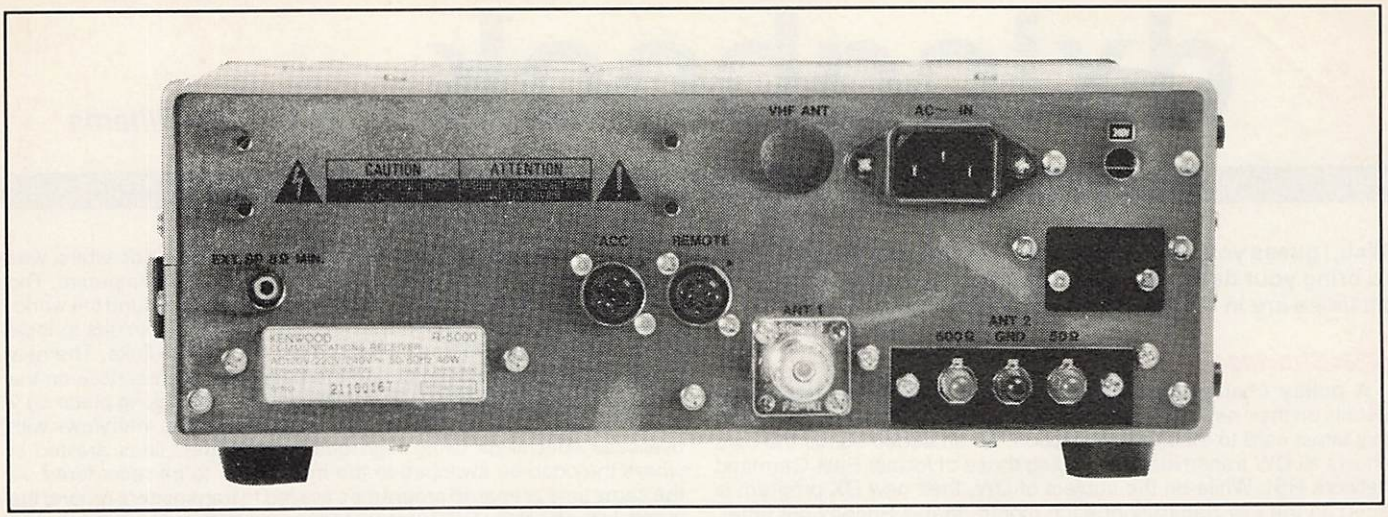
Good Sensitivity

Sensitivity is very good. As soon as a band opened out there was no problem with being able to pick out weak signals. There are three IFs, the first at 58.1125 MHz, the second at 8.83 Mhz and the third (for FM) at 455 kHz. While the radio comes with an IF shift, notch filter and variable selectivity controls I feel on the whole it is designed more towards listening to exotic shortwave signals than general broadcasters. As this radio has been sold as a semi-professional receiver you can expect it to turn up in many military and telecommunications establishments.

The notch filter acts to cut out narrow signals such as CW or heterodynes but, I found it too narrow. Below the selectivity control is a dual-function knob for the IF shift and noise blanker. The IF shift is very useful when there are two adjacent stations causing interference to each other. By shifting the rig's IF (Intermediate Frequency) you can move to either side of the two stations and reduce the interference. A very neat trick, although this doesn't apply to AM or FM signals.

The noise blanker is used to suppress the two common types of noise found on shortwave, these being car ignition noise and the infamous "woodpecker" or Over-The-Horizon Radar (OTHR) signals. Both noise blankers are disabled when using FM. Next to this are the volume (or "AF") and RF gain controls. The radio has four attenuator positions in increments of 10 dB which can be used in conjunction with the RF gain control to reduce receiver overload from strong signals.

The AGC switch allows you to vary the speed of the radio's automatic gain control. You can see how dramatic a



change this switch has on signals when used with the squelch. In slow mode as a signal drops off it takes longer for the radio to close the squelch, while in fast mode it is the direct opposite. Generally the slow mode is used to listen on voice mode, and is set to "fast" when tuning across the bands or listening to a CW signal. Onto the back panel (photo above), Besides the usual sockets for power and an external speaker there are provisions for a 50 ohm VHF antenna and DC power connector. HF antennas are well catered for, with a 50 ohm SO-259 socket and wire terminal point for a 500 ohm or 50 ohm lead-in wire. A 6-pin DIN socket allows you to connect your computer to the radio via the optional IF-232C interface unit and already some computer programs have appeared to let your PC drive the radio to even greater heights of flexibility.

So what does all this cost you? Well, if you're seriously looking at the Kenwood R-5000 then you're aspiring to join the ranks of "top gun" DXers, and there's a fairly stiff entry fee. The typical price tag is around $1600 but, in the shortwave world you get what you pay for. If you walk into the store with a $2000 cheque then you can spend the change on some accessories. There's a VHF converter which covers 108 - 174 MHz, at $285; filters, $85 each; a 12-volt power kit, $20; another $30 for headphones; a voice synthesiser for $79, and finally $150 for the PC interface unit. After you've done all that you may not have much money left to chase QSL cards with..!

Summary

The R-5000 is a great HF receiver and the sort of rig most DXers put on their Christmas wish list. If you're ready for the big time, this is the radio. If not, keep dreaming - and start saving!

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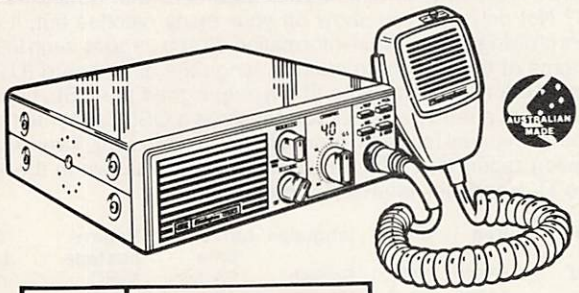

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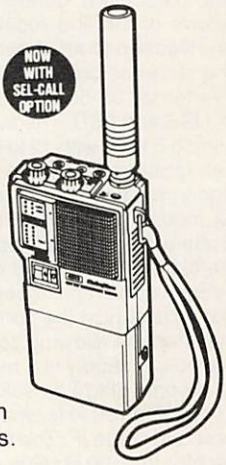

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dxlogbook

with Rob Williams

WHAT'S HAPPENING IN THE WORLD OF SHORT WAVE RADIO...

Well, I guess you're hungry for some more shortwave DX info to bring your databases up to date. Away we go - remember, all times are in UTC and all frequencies are kilohertz.

QSL Shortage in Germany

A policy change by Deutsche Welle to include full transmitter details on their new QSL card has led to a run by DXers eager to add this latest card to their QSL collection. As an added bonus the card shows all DW transmitters, including those of former East Germand network RBI. While on the subject of DW, their new DX program is aired on the last Saturday of each month (that is Sunday our time). The transmission goes out to Australia between 2100 and 2150 after their mailbag program.

Expansion Plans For NHK

Not long ago, Radio Japan had ambitious plans to expand their shortwave relay sites to improve audio quality to target zones. However, some of these grand ideas fell through and the only result we've seen so far has been a relay station at Sri Lanka. This site has 2 x 300 kw transmitters with four antennas and a control room located at Ekala, some 30 km northwest of Colombo. The site provides a service to south-west Asia and the Middle East for a total of ten hours per day. With Sri Lanka now operational some of the Middle East broadcasts from Gabon have been discontinued, allowing for expansion of Russian, Swedish and Italian language broadcasts to Europe. In the meantime NHK has announced that they will be installing three 300 kw transmitters at Yamata, 60 km north-east of Tokyo. Currently NHK has 4 x 300 and 4 x 100 kw senders together with 17 antennas. They also plan to install three new 'curtain' antennas beaming towards the Asian continent and south-east Asia. Yamata is expected on air in January 1993. Meanwhile three new QSL cards have been released by NHK and bear prize winning shots from last year's photographic contest for the Radio Japan calendar.

Drake's R-8 Sets The Pulse Racing

DXers in the US are jumping with enthusiasm over the first shortwave radio to be relased by an American company in many years. Long-time DXers favourite Drake seems to have read the market well as sales of all radios have increased over the last few years, particularly during the Gulf War. Following earlier editions' previews of the R-8 receiver, this much-awaited model has finally been released to an eager market.

The receiver covers 100 kHz to 30 MHz with an optional VHF converter for 35-55 and 108-174 MHz; modes are AM, FM, RTTY, CW, USB and LSB. The five built-in filter bandwidths (set at 6, 4, 2.3, 1.8 and 0.5 kHz, with 12 kHz FM-only) make it ideal for serious DXing. Other facilities include a synchronous detector and 100 channel memory; multiple scan functions for scanning by carrier, time or to seek modes or selected memories; twin VFOs plus built-in preamp and attenuator. There's also a timer, dual time-zone clock; dual mode noise blanker; passband offset, inbuilt speaker, inputs both for low impedance and high impedance aerials and selectable AGC.

And as is almost the norm these days, the R-8 includes an RS-232 serial interface allowing connection to your computer.

The power supply is a multi-voltage unit which implies that the R-8 may at some stage be sold world-wide. The first IF is at 45 MHz and the second at 50 kHz, with main selectivity provided by LC filters in the second stage IF. The 6/60 shape factor is shown as 2:1 (roughly), except for the 500 Hz filter which is 1.5 kHz at -60 dB. This all sounds very impressive, but as yet no-one will say when or if the R-8 will be coming down under. If it does, you'll read about it right here!

BBC Moves Into The 21st Century

As previously reported in these pages, the BBC is rapidly moving to expand transmitting facilities not only at its various relay stations around the world, but also back home at Bush House. The switching room, a sort of circa-1955 telephone exchange for broadcasters, was updated with a new control room driven by over 500 computers. The BBC is responsible for over 105 transmitters spread around the world. Some 60 programme lines leave through terrestrial circuits to local transmitters while overseas sites are fed by satellite links. The new centre was commissioned during the Latin American service on the 23 February at 0000 UTC with the official opening taking place on 9 May. The control room provides two basic functions. Interviews with overseas specialists using high quality broadcast lines are fed in where they can be switched to the interviewer to be recordered. At the same time prepared programes are fed to transmitters around the world. In the past the BBC was forced to work with program packages of a minimim of 15 minutes (on special occasions five minutes), but with the new equipment programs as short as one second can be aired to any destination around the world. As the World Service is heard 24 hours a day in most points on the globe, they can now remove any number of transmitters from the main feed and insert different programs specially tailored to a particular group, then bring them back into mainstream programming. Over 20 simultaneous programs can now be catered for. The new control room uses the latest in digital equipment to make full use of BBC's investment in digital broadcast lines used to link sites.

More SW Gear From DSE

Dick Smith Electronics has expanded their range of shortwave radios to include a rebadged version of the Grundig Yacht Boy 230. Marketed under the name of Panopus and with a price tag of $169, the new portable covers 13 shortwave bands, longwave, AM and FM. DSE also has a long-running model with shortwave/HF reception plus limited VHF coverage together with a built-in direction finder. The VFO would make this rig doubly useful for tuning into SSB signals from utilities, hams and CBers. This model sells for $149 and either it, or the Panopus/Yacht Boy, would be good entry-point rigs for first-time SWLs and DXers.

QSL Reporting

Those of us who have been chasing QSL cards will be aware of the excitment we feel when our reception reports are verified with a card. The thrill is even greater if it's one of those hard-to-verify stations. Well, why not share your excitment with others here via CBA? Not only can you show off your many catches but, it helps others chasing QSLs. What information do you need to send in? Just the name of the station, frequency, language, time heard (UTC), if you sent return postage, who (if anyone) signed the QSL, how long it took to get a reply, whether you received a QSL card or letter and any other material (stickers, brochures) you were sent. If you sent the reception report to a different address than is shown in the World Radio TV Handbook please include this too.

Station	freq	time	language	turn-ar'nd time	Return postage	Card/ Letter
KTBN	15590	2107	English	23 days	1 IRC	card
BRT	11695	0736	English	90 days	none	card
DW	17780	0909	English	21 days	none	card
TWR-Monaco	9480	0740	English	23 days	none	card
RFI	21770	1400	English	63 days	none	card
VOFC	11915	2202	English	21 days	none	card
Vatican Radio	9600	2204	English	88 days	none	card
DW via Antigua	6160	0900	English	23 days	none	card
Radio Yugoslavia	17725	1300	English	15 days	none	card
All India Radio	9910	2200	English	48 days	none	card

That gives you an idea of what I want to see, so drop me a letter with your own QSL reports and I'll include it here.

Rob On The Rounds

While visiting Melbourne on business last month, I enjoyed the opportunity to catch up with old friend Peter Bunn, editor of OZ DX magazine, and Dave Onley, another keen DXer. Over a few beers Peter told me of his adventures in India as well as the international success of OZ DX.

Peter and Dave brought me up to date with DX events in Melbourne, and unfortunately lack of time time prevented me meeting some of my other DX friends in the southern capital - next time, maybe. DX Logbook has printed many tips from OZ DX, they are quite popular and Peter assures me that this will continue.

SPARC's New Country List

Throughout DX circles there has always been much debate about the accuracy of 'DX country' lists. Everyone you speak to has different thoughts and opinions on the best approach to building and working from a common country list. But, what are country lists?

Let me give you a good example. Take religious shortwave powerhouse KTWR. From it's base in Guam, KTWR has been beaming strong signals into the Pacific for many years now. Guam is a US territory of course, however, it has very different propagation characteristics from the mainland US. So it would be crazy to consider Guam as the same 'country' as the USA when logging stations or collecting QSL cards. Lists rely not only on propogation characteristics, but also on political boundaries, so East Germany was considered seperate to West Germany - and even today East Germany still can be included in individual totals!

Shortwave DXers are little different from hams or CBers when it comes to counting the number of countries they have worked or heard.

However, unlike lists compiled by the ARRL, IARU or the 'freeband' 11 metre group, AT International, there is no single recognised country list for SWLs. Obviously by developing a common country list it would be easier for enthusiasts to compare their total tallies. Groups belonging to the much-respected South Pacific Association of Radio Clubs (SPARC) have spent much time updating and re-evaluating their definition of what constitues a country list. The Southern Cross DX Club recently conducted a survey among members and suggested using the countries list of the World Radio TV Handbook. While this made the list available to everyone who owns a copy of the WRTH, considered the SWL bible, it was considered many countries that are now 'extinct' still need to be included. SPARC has now produced a new list which is available to all for member clubs.

Radio France To Asia And Oceania

RFI's English language broadcasts to this region are aired at 1400 on 11910, 17650 and 21765. Another opportunity comes in their beams to Africa between 1600 and 1700 on 15530, 17620 and 17795. This sked is current until 28/9.

A Chance To Hear RSA

Although RSA no longer broadcasts world-wide, there is a still a chance to hear some of their English broadcasts aimed towards the African continent: to Nigeria, West Africa, East and Central Africa between 04-0500 on 11860, 11920 and 5960; to East Africa between 1000 and 1100 on 11900, 11860 and 9555; and between 1500 and 1800 to Southern Africa on 15365.

HCJB Does It Again

HCJB has announced more details of their 60th anniversary radio celebrations. They now plan to make a special Christmas Day program to be broadcast on their original shortwave frequency, first used back in 1931. While this spot has long since been re-allocated to another station, HCJB is negotiating to use this for their very special once-off broadcast. A 60th anniversary QSL card is also being planned. More on this as news comes to hand.

That's another column put to bed.
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Trying to install a CB rig in your car ?

GET IT RIGHT THE FIRST TIME

I guess that almost everyone who rushes home with his first rig will rarely spend much time on setting up the rig properly before trying out this new "toy". There are no technical reasons why you can't just lay the rig on the car's seat beside you, hook up your power lead and connect up a properly tuned antenna.

Unfortunately, everything will work well until you either have to step on the brakes or you try to turn a corner. Your brand new rig could end up in a crumpled heap on the car's floor - and I don't think the retailer would accept it back under warranty.

The obvious answer then is to hook up the rig properly in the first place, even if it means you mightn't be able to get on air immediately. Failing this, wait until you get home and then use the rig while it's just sitting on the seat. Having got that first "rush of blood to the head" out of the way, you can then settle down and install the rig properly.

Before hauling out your drill and getting stuck into turning your car's dashboard into a piece of Swiss cheese, stop to think about exactly where the rig would be best fitted. Many factors can come into this choice as the dash layout differs from car to car.

In other words, you can't necessarily hook the rig up under the dash and expect it to stay there. Most modern cars have a plastic dashboard which makes the installation of even a small transceiver difficult, let alone fitting a hefty Grant or Cobra 148GTL.

Luckily, many vehicles have a centre console which can usually be used to mount the rig. Often, they have push out sections for fitting accessories which can be utilised for your CB.

In-dash installation invariably takes some time and may even require some assistance from your friendly electrician/plumber/panel beater and more...

Other cars have different "best" positions. Certainly, the most popular location for a CB is under-dash mounted. This position is good because not only is the rig easily accessible for both driver and front seat passenger, it is a very easy spot to get at with a drill and to fit the rig.

Other favorite installation spots include the overhead console which is often fitted to vans and four-wheel-drives. Overhead consoles have another point in their favor that many people seem to ignore. If a rig is mounted only a few centimetres or so from the carpet, the speaker sound is muffled quite severely. By fitting the rig above the driver's head, the audio isn't muffled but comes through loud and clear, then again you can fit an extension speaker to any rig and place the speaker where you can best hear it.

It's certainly clear that, if you wish to do the job properly, you must be prepared to sit down and think out the entire installation before you start. The extra effort you put into it will be repaid a hundred times by the fact that the rig is integrated into the overall dash design and doesn't look like a cheap add-on or afterthought.

A couple of points on the actual installation might help.

Always make sure that the mounting point will be strong enough to take the weight of the rig, even over very rough roads. The other is such a basic one that I don't even like mentioning it - except for the fact that I've seen so many installers muff it. This is to use a centre punch to provide a starting point for your drill - there's nothing worse than a huge scratch mark right across the paint work.

Before we get stuck into the how and where of mobile antenna installation, let's go back over a couple of basic points. It must be remembered that a transmitting/receiving antenna should be a half wave length - or multiple - in height which, in the case of 27 MHz CB would mean an antenna about 5.5 metres (18 foot) high.

As this isn't practical for mobile use, the manufacturers cheat - twice. Firstly, they use a quarter wave length 2.75 metres (9 foot) antenna and use the body of the vehicle for other half - to make it the equivalent of an 5.5 metre antenna.

Secondly, they load the antenna electrically so that they can use a shorter overall length.

These antennas can be as short as 18 inches overall, but, sometimes their performance suffers and in some instances a small, el-cheapo antenna will only deliver about half of the power fed into it from the rig.

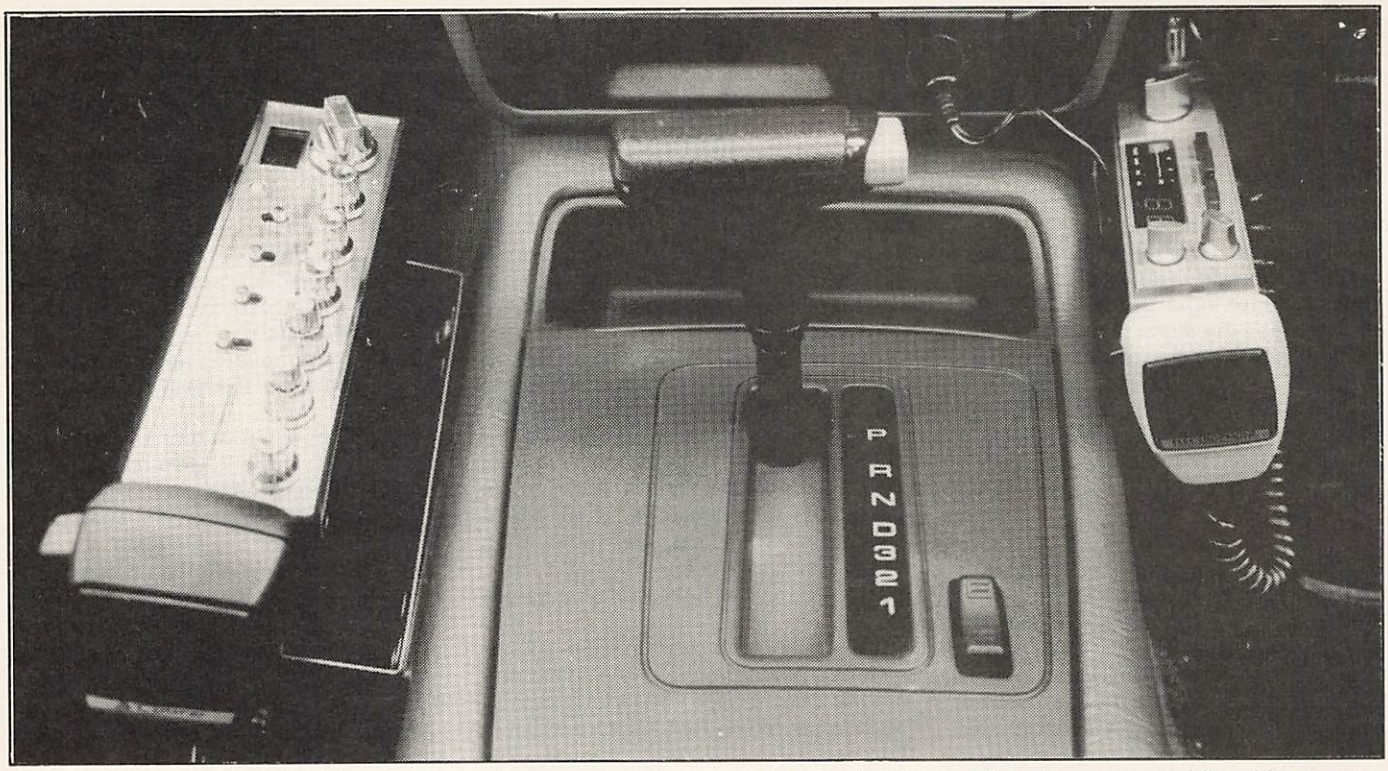
Another factor that is either overlooked or ignored is the position of the antenna on the car. Not only is the highest point on the car the best for the radiation pattern, but as it's higher than the rest of the car, it will allow you to get out further.

Antennas mounted off centre - boot mounted, gutter mounted, mudguard mounted, etc. - have a lower ERP (effective radiated power) than their centre mounted brothers because of their directional bias.

To put it all in a nutshell, if you want to get the best from your mobile CB, mount your antenna in the centre of the car's roof.

What size or type of antennas are best? Everybody seems to have their opinions on just what is the best type of antenna. The advantage of either a centre or top loaded whip as against a base loaded

Read this article before you even buy your first CB rig. There are plenty of traps for beginners and we've spelt out a few of them. Take your time, ensure that you buy the right rig for your vehicle and then properly install the antenna. After that it's all downhill!



Above: Plastic dashboard means you fit 'em where you can, in this case on each side of the transmission tunnel. Lower Right: Extension speaker is mounted below dashboard but still provides plenty of audio.

whip is in the broadness of the tuning - not in the radiation pattern, as many people seem to think. Most antennas on the market are locally made helically wound fibreglass whips and virtually all are good quality as unlike the early days of CB when everyone was an "overnight expert" on antennas, the companies now producing them are long experienced and their antennas are well proven on the market.

STICK WITH THE NAMES

Names such as Mobile One (arguably the largest producer of antennas - CB, aerial and commercial - in Australia), ZCG, Powerband, South Pacific Marine, Station Master, etc. have all been around for 20 years and more and the high overall standard of their various antennas reflect their long involvement in the CB industry.

Having said that most mobile antennas (whips) are electrically shortened to give the equivalent of a quarter wave length, I didn't mention that you can buy a 2.75 metre (nine foot) whip, usually fitted to a spring loaded base, which, in theory, should be a better antenna than its shorter brother.

While this may be true if the antenna can be mounted in the centre of the roof, the highest practical installation point for a 2.75 metre whip is on the mudguard - though most are rear bumper-bar mounted or in the case of four-wheel-drives on the bullbar.

Two factors govern the effectiveness of this 2.75 metre whip. With the quarter wave whip mounted off centre, the antenna becomes direction able, meaning a lower ERP in most directions. The other point is to do with stability While the vehicle remains stationary, the whip retains its vertical characteristics and therefore, its low SWR. As soon as the vehicle becomes mobile, this antenna bends, which in turn detunes it, resulting in a higher SWR (and therefore, reduced ERP). If you try and obtain an excellent radiation pattern by mounting your antenna in the centre of the car's roof, you will find that the longest antenna you could use would be about 1.85m (6 ft.) in length. (Even these antennas can cause problems as they have to be fairly rigid to

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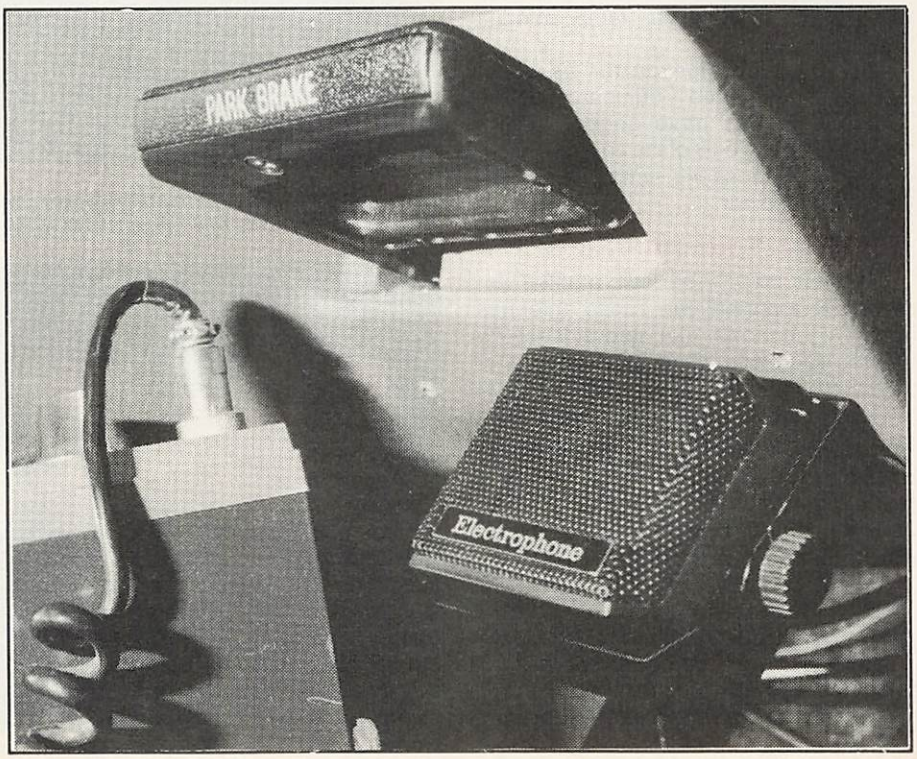


GET IT RIGHT THE FIRST TIME

(continued)

remain upright in strong winds (or when the car in moving at 60 km/h) but still need to have sufficient flexibility to withstand being hit by an overhanging tree branch or other obstacle. You wouldn't want to have a super rigid antenna that was stronger than the metal of the car's roof.

On-air checking between different antennas of the same height has led me to believe that there are virtually no differences in performance between antennas of the same height with the same SWR.

DO YOU NEED A HOLE IN THE CAR'S ROOF?

There are many ways of installing your mobile antenna and while the best may be through a hole in your car's roof, this isn't always possible or for that matter desirable, like who the hell wants to drill a hole in their brand new Mercedes-Benz or even an old Holden HQ for that matter. Many CBers are using a single ski bar to centre mount their antenna, and while they would have to be careful to ensure a good earthing or electrical bonding between the rack and the roof, the system seems to work very well. The next best would be a gutter mounted antenna or the centre roof magnet mount while still another variation could be a ground independent antenna.

Antennas mounted on the car's mudguard aren't as efficient as the roof mounted ones but can be readily fitted to fitted to an existing car radio antenna hole.

The worst position as far as directionality is concerned is bumper mounted. These antennas have good direction across the main bulk of the car but radiate very poorly across the sides or way from the rear of the car.

FORGET A TWIN-TRUCKER

Do not fit co-phased "twin trucker" antennas to a normal car. These antennas are designed to be mounted at least 2.5 metres apart with a very large amount of metal around them. In this position, they do have a slight forward "gain" across the axis of the antennas. This means that if they are mounted on the side mirrors of a truck, they will have a small amount of forward and backward gain at the expense of the signals coming off the sides.

I understand that, if they are mounted closer than around 2.5m, the RF output power is divided between the two antennas and the ERP is reduced by half. Apart from this, the directional characteristics change to along the axis (sidewards on the car).

Don't buy a large-sized CB and expect it to fit easily into a small car. While we firmly believe that the "old style" Grant and Cobra 148GTL are among the best available, the unfortunate fact is that they are large and heavy by modern standards and very hard to fit into today's passenger vehicle. Given a limited amount of space, you need to consider smaller, lighter rigs of which there are plenty available.

Plan out the entire installation before starting and then check it out again before even thinking about drilling that first hole. If you elect to mount the antenna on the roof you might be wise to have a panel shop or experienced installer fit the mount and run the coax cable. Yes, it will cost a few dollars but this may well prove to be a sensible investment.

Centre punch all hole markings before drilling.

Make sure the rig can be easily seen/operated from the driver's seat and that the driver doesn't have to stretch to reach the controls. Also be sure that it is mounted in a position which doesn't allow the microphone cable to wrap itself around the steering wheel

Make sure the supporting structure for the rig is strong enough to support it when driving over rough roads, in short, don't mount it with little self-tappers into a plastic dashboard. The longest mobile whip you can use is best but you obviously need some common-sense. While a long antenna might look great and work well, it's also likely to wipe out a bank of fluorescent lights the first time you drive into a garage or car park.

Centre roof mounted antennae get out further and have the best radiation pattern.

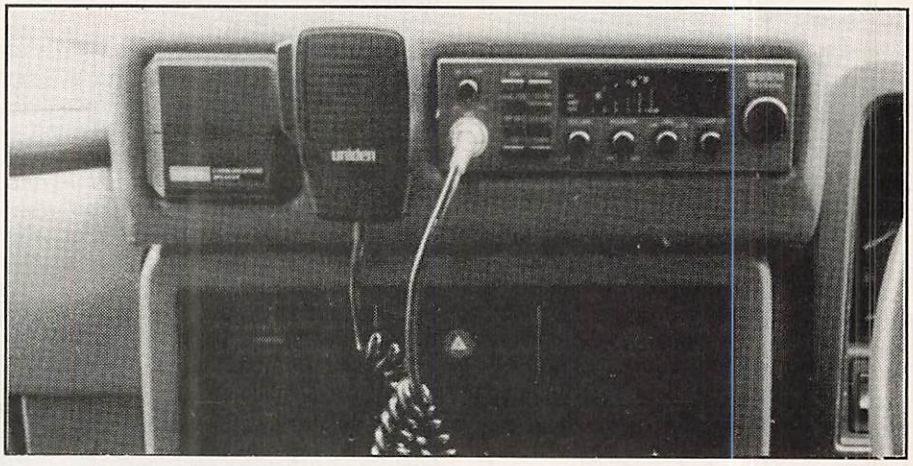
Assuming equal antenna length and equal SWR, there is no noticeable difference between any antenna type.

Be careful not to pinch the coax cable between the door and the jamb.

Ensure adequate earthing between the antenna and the car.

Boot mounted antennas should have an extra earthing lead from the base to the main body of the car (boot lids often have poor earthing).

If in doubt, check first with an experienced CB installer.



Above: ***Rig fits neatly into after-market accessory panel in Nissan Patrol.***
Below: ***Not so lucky in a Landcruiser where rigs go into the only available spot.***

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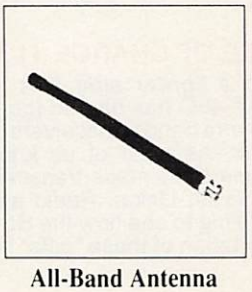
Super Amplifier



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dx international

DX - UP, DOWN and AROUND 11 METRES ***...with Jack Haden***

Most of you will no doubt be surprised about the sudden change in format for this edition of DX INTERNATIONAL, the main reason being I have been away in the Central Pacific for the past two and a half months and haven't had a great deal of time for the radio due to business and family problems. Thus I have been out of touch with any recent happenings on the 11-metre band and even when I did switch on the radio I found propagation to be so lousy that I switched it off and diverted my attentions elsewhere.

Apparently some people do read what I write, especially the features on the 27MHz FREEBAND fiasco. CB Action editor Len Shaw received a number of phone calls about the articles, some reactions were favorable and some were not. If you feel like putting pen to paper then you can contact me via CBA's Melbourne address. I would be extremely interested to hear what others think about the concept and we may even publish the odd letter, if it proves interesting enough! There is a little more food for thought on the matter in this column, so read on.

212-AT-105 OUT OF ALFA TANGO GROUP

I was surprised to hear that prominent DXer, Sture 212-AT-1O5 from Aland Island, has been expelled from the Alfa Tango group. Apparently Sture has failed to renew his membership for the past three years but still uses the AT call sign. Reports also suggest that Sture has been asking for US$5 to confirm contacts which made quite a few people irate and resulted in many letters being sent to Mr Aldo 1-AT-OO1. Accusations were also made by Finnish DXer Jay, the 56-AT485 who recently launched a DXpedition to Aland Island as 212-AT-DX, that Sture deliberately caused harmful interference to the operation complaining that Jay was taking potential "customers" away from him on the band.

USSR QSL CARDS...?

It seems a large number of DXers are having problems "extracting" a QSL card from fellow DXers in the USSR despite having sent a cash donation for mail costs. Apparently some Soviet DXers are finding that the "donation" money is better spent on the thriving Soviet black market which feasts on foreign currency. One British DXer sent 21 cards to the USSR and to date has only received one back, so be warned, it seems some of these people are cashing-in on their newly acquired "rare" country status, lining their pockets along the way.

FREE OF CHARGE 11 METRE RIGS

On a lighter side, it is interesting to note that Brian, the 26-AT-45O has offered Igor, the 50-AT-106 in the USSR, two 11-metre band transceivers free of charge to get more operators on air. As most of us know it is nearly impossible to buy commercially made transceivers (outside the black market) in the Soviet Union. Radio amateurs in that region have been operating to see how the Soviet customs bureau deals with the importation of these "gifts" from the west.

THERE'S EVEN PIRATES AMONGST THE PIRATES

Beware of slims, as you will remember in the last edition I questioned the authenticity of 1O1-AT-14, Jon, who was telling everyone he was in Papua New Guinea. Well it turns out "Jon" hails from Tasmania and gets his jollies by playing this little prank from time to time. Last heard "Jon" had shifted Tasmania to Antarctica and was playing silly buggers once again, so you've been warned!

MORE NEWS ON FREEBAND

Meanwhile, in Europe the battle still goes on for the 27MHz FREEBAND, and judging by the following letter that I have reprinted from the UK edition of 11 NEWS efforts maybe all in vain.

It's an interesting read but whether it is factual or not is another matter.

Dear 11 NEWS and 26 ATs,

As a non member of the ATs I hope you will allow me the chance to redress some issues from the March '91 edition. I understand that this may be an exception to the rule but, it is important that the 26 members fully understand the "facts", and believe less in fiction.

Many of my friends are AT members and I wouldn't wish to decry the work which some are doing behind the scenes but, when it comes to an issue such as SSB for CB radio throughout Europe, certain important facts have to be taken into account.

As someone who actively supports the fight for SSB and better working conditions on CB radio in the UK and Europe, my work takes me to areas outside the norm. This means that I have access to information which is sometimes confidential. I am not breaking any rules by giving the following information which is sometimes confidential. Limited space in 11 NEWS does make it hard for me to clarify some points in greater detail. However, these are the facts whether we like it or not!

In a recently published CEPT (Committee for European Postal and Telecommunications) document a number of European countries declared their intentions to withdraw AM CB use and even went so far as to stipulate specific dates for closure of the service. Regardless of what you might like to believe only two European countries are holding out to retain SSB (Italy and France), and, from official documents listing "legal" CB usage for Europe legal SSB use is not as widespread as some are making out. The RA (Radiocommunications Agency) for the UK have declared that they will never allow CBers to have SSB.

So, how easy would it be for "user power" to bypass or go against RA beliefs? The simple answer is - impossible.

With the "single market" issue for 1992 comes what is known as "Common Air Interface" (CAI). This means that all countries are seeking to align radio spectrum users and usage. This frees areas that are undersubscribed, thus allowing for more business growth - and again allows "single market" goods to be sold throughout the EEC. The main EC body charged with the overseeing and allocation of European radio spectrum is CEPT. It draws its members from various countries, and CEPT has been given the duty of bringing all the "national" standards together to the ETSI (European Telecommunications Standards Institute). The ETSI formulate a single standard from member countries national standards, these are called ETS's. Please note that the mids FM (CEPT PR 27) is now covered by an ESTI standard - PRETS 3OO 135 and replaces MPT 1333. In the future nearly all EC national standards will be replaced by ETS's, and, under the common agreement for the manufacturing equipment standard (under an ETS) you will not have a common European usage agreement.

The ETSI has members from CEPT member countries and individuals. The UK is directly represented by the Radiocommunications Agency (RA). Each member country has a number of votes, which are used to agree or object to a common standard being issued. These are: Austria 3, Belgium 5, Cyprus 2, Denmark 3, Finland 34, France 1O, Germany 1O, Greece 5, Iceland 2, Italy 1O, Luxembourg 2, Malta 2, Netherlands 5, Norway 3, Portugal 5, Spain 3, Sweden 5, Switzerland 5, and the UK 10. In order for any standard to be passed it needs to receive at least 72 per cent of the votes, which can be a problem when you consider that most votes will be cast by the various governing administrations from the respective country.

This means that if the RA or other administrations do not want you to have a specific service (ie. SSB), they simply vote against the ETS.

When setting out proposed new ETS specifications each member country has to abide by rules and regulations - these are too complex to be explained in this small space. But, they have to go through a number of stages with time limitations and

each specification has to go before various committee-type groups. Work on the new prETS 3OO 135 was carried out by Working Group 8X (WG8X), of which I am a member and the only CB representative. At various levels comments and alterations are proposed to the original specification before eventually the second draft is sent back to ETSI.

These proposals are then put together forming a second draft, which is sent back to each country for final comments before it is returned to ETSI, and the vote is taken. At each stage RA has a hand in the group meetings held in the UK and is present at all meetings between various countries' administrations. It also oversees the final decision-making meeting at which it advises ETSI of how it is casting its 1O votes.

GRUPPO RADIO ITALIA

ALFA TANGO

INTERNATIONAL DX GROUP

DIVISION : TURKEY

116 AT 104

Op. SOYHAN
P.O. Box 82
Ç P. 81031
İstanbul - Turkey

ITU:39 TO RADIO: ZONE:20

FREQ	DATE	TIME	MODE	R-S-T	QRM		PSE
			USB		QRN		TNX
					QSB		QSL

"Calling all over the world"

There has been plenty of activity from Turkey recently and 116-AT-104 is one of the more regular stations from this country.

Although brief, the description given above - I can assure your 26 AT members - is a complex issue and one which has to be carried out by each CEPT member country.

And before this series of events can even begin each of the administrations has to decide whether they want this particular service as a common European standard - for CB most countries would be happy for us to be on 4O channels FM "only", so SSB has very little chance of gaining the initial support.

In the event that you try to approach CEPT without first going through the RA, CEPT will simply send your request back to the RA for its official sanction. In which case the pressure for legal SSB applied for by Italy and France would amount to nothing.

Then there are other factors to consider when it comes to "legal" SSB for Europe:

1. Would it enhance the enjoyment for present users by having more overcrowded frequencies?

2. With a more populated use wouldn't this decrease the present QSO distances, and wouldn't it make the QSO more difficult?

3. Would the Italians agree to abide by the legal regulations governing power output, type of equipment that could be used and adopt a licensed system - thus taking away their freedom?

4. Even with built-in safeguards what would stop SSB ending up like UK FM?

These issues and others need to be looked into before someone embarks on a crusade to alter what is "the only true CB radio system" left. Once legalised and possibly spoilt there will be no turning back - apart from giving the administrations the chance to legally and completely withdraw its use.

As a final point on this subject it is worth a mention that the status covering CBers and radio amateurs is different. The manufacturers of amateur equipment and certain rules/regulations for its use by users is covered by International Radio Regulations (IRR).

CBers and the use of CB equipment is governed at present by national rules and regulations, national standards, or in the case of CEPT PR 27, the prETS 3OO 135. Both are separate items and cannot under present laws be combined.

In the same 11 NEWS I note that Ken, 26-AT-212 calls for help from other groups and groups outside of the Alfa Tangos in the fight for legal SSB. On behalf of our organisation I would find this hard to do. Why? Because some months ago I offered to help UK AT members in the fight to save their PO Box from closure by the RIS. I had this offer thrown back in my face and 11 NEWS carried a story that told AT members "not" to contact me.

Thankfully one AT member did and we not only secured the return of his PO Box but, the Post Office even refunded his cash to cover the period of closure.

You may also be interested to know, that the pressure to close AT members' PO Boxes in the UK and abroad, came from the EC via CEPT to the various governing administrations so the Alfa Tango International DX Group will have a very hard time raising support for legal SB within CEPT!

Clearly most 26 AT members put themselves before the good of the group or fellow members, and, having kicked me in the teeth why should I now offer you my support, campaign to help you or give you privileged information (built up over the past seven years) or even oil the wheels in the corridors of power? Friendships are based on mutual respect and you will need as many friends as possible if you intend to take on the system!

Some of you may find my attitude hard to swallow, but I am sure that you would honestly feel the same way if you were put in my position. And when considering where to find support from friends consider this - the next time you and other worldwide AT members are on 555 and you fail to acknowledge other users because they are not ATs, or, you don't send/return QSLs, every one could be a potential supporter for your campaign.

I am sorry if this letter seemed lengthy but explanations had to be somewhat detailed. I only hope that you will print this letter in full because each part is in itself important, and your members deserve the right to have the full facts. "

Good Luck" in the future.

Signed: Mr Ian Oliver, Vice Chairman & PRO.

(continued over page...)

There are many interesting viewpoints in Mr Oliver's letter to 11 NEWS and whether or not it is all factual remains to be seen, perhaps those who are familiar with the European radio management system would be more qualified to comment. One point that he was indeed correct on was the closure of some DXers' private post office boxes. I remember back last year when the DTI in Brazil closed down many post office boxes used by AT stations for QSL mail.

You may remember a few issues back in this column I reported that the Korean authorities were investigating Han, the 1OO-AT-1O1 in Seoul, because his rather excessive amount of incoming foreign mail warranted an investigation by both the radio authorities and postal department. A few other AT stations in Central and South America have received similar attention in the past.

Here in Australia the potential exists also for such activity and there is nothing stopping the radio branch people on checking up to find out who operates a particular post office box should the need arise.

A simple phone call or visit to the Postmaster would soon reveal the details of the box holder.

You may also notice that an increasing amount of "rare" DX stations have opted for a QSL manager rather than transmit their address on air, the main reason being that they don't wish to draw too much attention to themselves in their own country, and thus come under investigation by authorities.

REPORTS ON 137-AT-RA SPECIAL EVENT STATION

Over the period 22-30 March many of you would have heard the special event station 137-AT-RA about the band. Operated by 137-AT-1O1 Roy and 137-AT-362 John, with back-up operators 137-AT-1O3 John and 137-AT-124 Dave, the station received a considerable amount of attention despite some other DXpeditions being active on the band at the same time. The request for a $US2 donation was approved by AT Headquarters in Asti with $1 going to the Romanian orphans appeal.

John and Roy spend something like 15 hours straight at the mike with meal break time being covered by 103 John and 124 Dave.

Total number of contacts was 1OO4 covering 82 DXCC countries, the station went to air at O73Oz daily until the loss of propagation, the only major problem being severe sunspot activity on the third day, which resulted in no propagation at all for the next three days.

The equipment used was a Yaesu FT-757GX through, either, a five element yagi horizontal or a Avanti Sigma four vertical antenna. For those who still need a card then the route still is via 137-AT-1O1. Don't forget your donation.

Well, that about wraps it up for this issue. Sorry about the sudden change in format and the reduction in general news content, things should be back to normal in the next edition. As usual my thanks to those who bothered to keep me informed.

DXPEDITION NEWS UPDATE

* ***The Gambia appeared as scheduled over the period 29 April to 3 May and many in the South Pacific made it through despite poor conditions on the band at times. On 3O April I could hear many stations in Australia making contact with 118-AT-0 with reasonable reports exchanged, although I could not hear the station at all on Nauru Island. QSL via 14-AT-O27 in France.***

* ***Ogasawara Island appeared more or less on time by way of Japanese DXer Mr Tetu, the 25-AT-1O3. Mr Tetu was signing as 281-AT-0 and had a large throng of people calling him. On 28 April he was a good five by five at 0512z on Nauru. QSL via 25-AT-1O3 in Japan.***

* ***The rumored DXpedition to Guyana signing as 131-AT-0 failed to appear over the periods 22-23 June and again failed to appear over 3O June-1 July. It was to have been operated by a team from Venezuela and if you were lucky enough to have secured a contact then cards go via 5-AT-141 in Venezuela.***

* ***The scheduled DXpedition to Swaziland, signing as 191-PW-0A and 191-PW-0B, was cancelled due to some last minute problems.***

* ***China failed to appear as 2O3-AT-0 over the period 1-2 April, however, it is now scheduled to take place over the period 2O-25 August with the QSL manager being 1-AT-068 in Italy.***

* ***Coming up in August will be 313-AT-0 Tadzhikistan in the USSR, scheduled to appear 2-7 August. This station will be operated by 3O8-AT-1O3 and 3O8-AT-1O4. QSL manager is 1-AT-O68 in Italy.***

* ***Turkmenistan in the USSR will also be activated by way of a DXpedition conducted by 3O8-AT-1O3 & 1O4 over the period 10-15 August signing as 314-AT-0. Again the QSL manager is 1-AT-O68 in Italy.***

* ***Crete is still scheduled to appear 19-23 August by way of 9O-AT-DX and will be operated by 18-AT-1O9 and 18-AT-136. QSL via 18-AT-1O9 in Greece.***

* ***Romania is still planned for 3-9 August signing as 233-NF-0. This will be a much needed one for many and cards go via 14-AT-O27 in France.***

* ***Albania has been confirmed for activation over the period 1O-15 August and will sign as 251-NF-0 for the duration. QSL manager is 14-AT-O27 in France.***

* ***Jary, the 56-AT-485 who recently operated from Aland Island as 212-AT-DX, reports that he worked a total of 1400 stations in 58 DXCC countries, despite alleged QRM from ex-AT member Sture, 212-AT-1O5.***

* ***Despite rumors of a DXpedition operating from Svalbard, there has been some activity from 171-SR-O1 operated by local resident Einar. Lucky DXer 43-AT-395 managed to scoop this one last year and received a QSL confirmation for his effort. Meanwhile Einar has been heard from time to time around the traps this year, so there is an interesting one to look for when signals are coming in from Scandinavia.***

* ***Rino, the 1-AT-9OO who recently operated from 214-AT The Congo, reports he made 1333 contacts in 73 DXCC countries. Not a bad effort there.***

NOTE: Skip conditions are virtually the same from Sydney as they are for all other East Coast areas — likewise Perth predictions can be taken as similar to those for other West Coast areas.

ADDRESS NO. 8303

DATE SEPTEMBER 1991

```
SYDNEY-JAPAN                    7825
27.0 MMMMMMMMMMFFFFF%..    MMMM
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-C&E.COAST USA           15712
27.0 %%              ..  .%%%%%
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-NORTH AFRICA            17109
27.0      .FFFF%. ..        ..
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-ENGLAND LR              23031
27.0          .              ..
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-CENTRAL EUROPE           13575
27.0       .%%%%%%%%....
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST INDIES              18005
27.0 %%%%%%..                 .%
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-NEW ZEALAND               5255
27.0 %%%%%%..                  %%
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST AFRICA LR           26220
27.0 %%%%.  %F%.....          %%%
   MHZ !    !    !    !    !
      00   06   12   18   24

ADELAIDE-P.N.G.                 2960
27.0 FFFFFFFFF%.......        .FFF
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-MIDDLE EAST             12903
27.0   %FFFFFFF%.....
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST COAST USA          11951
27.0 MMMMMF%%....    . .%MMMMM
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-PAPUA NEW GUINEA         2740
27.0 FFFFFFFF%.......         %FFF
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST AFRICA LR          23596
27.0 %%%%.. .%%%%%%...      %FF%%
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-SOUTH AFRICA              8315
27.0       %MMMMM%%
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-SOUTH AMERICA            14569
27.0 .%%%%%%.  %.             .
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-ENGLAND SR               14480
27.0        ..%%%%%%....
   MHZ !    !    !    !    !
      00   06   12   18   24

MELBOURNE-P.N.G.                3157
27.0 FFFFFFFFF%.......        %FFF
   MHZ !    !    !    !    !
      00   06   12   18   24

BRISBANE-NEW ZEALAND            2506
27.0 %%%%%..                  %%%%
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-CENTRAL EUROPE          16090
27.0        ..%%%%......
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST INDIES             14950
27.0 FFF%%%%.    ..          %FFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-ENGLAND SR              16993
27.0        ....%.......
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-JAPAN                     7923
27.0 MMMMMMMMMMMFFFFF%..     .MM
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-C&E.COAST USA            18614
27.0 %.              ...      .%%
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-NORTH AFRICA             13941
27.0 .    .FFFFFF%..           .
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST AFRICA SR           13804
27.0  %...  FFFFF%.
   MHZ !    !    !    !    !
      00   06   12   18   24

BRISBANE-P.N.G.                 2090
27.0 FFFF%%%%..    ..         .FFF
   MHZ !    !    !    !    !
      00   06   12   18   24

ADELAIDE-NEW ZEALAND            3214
27.0 %%%%%%%..                .%%%
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-SOUTH AFRICA            11036
27.0      .MMMMM%.
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-SOUTH AMERICA           13180
27.0 %%%%%%%%.                .%%%%
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST AFRICA SR          16428
27.0 %%%..  %%%.              ..%
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-MIDDLE EAST              10077
27.0    %MMMMMMMMMF%%....
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST COAST USA           14743
27.0 FFFFF.              .     %FF
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-PAPUA NEW GUINEA          4073
27.0 %%%%%%%%%.               .%
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-ENGLAND LR               25544
27.0          ....
   MHZ !    !    !    !    !
      00   06   12   18   24

HOBART-PAPUA NEW GUINEA         3711
27.0 FFFFFFFFF%%.....         FFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

DARWIN-NEW ZEALAND              5321
27.0 %%%%%%%.                 .%%%
   MHZ !    !    !    !    !
      00   06   12   18   24
```

These GRAFEX predictions present the expected HF propagation conditions between Australia and a number of DX areas. Note that the predictions are given in Greenwich Mean Time from 0000 to 2300 hours reading from left to right. Each prediction shows the circuit name, distance between the terminals and information on propagation for the 24 hours. A GRAFEX symbol describes the predicted propagation conditions at 27MHz for one hour. The letter "F" designates the best conditions for HF communications.

GRAFEX prediction charts are supplied courtesy of the Ionospheric Prediction Service, Level 4, 15 Help St, Chatswood NSW 2067. IPS offers pre-recorded telephone information. To access the service, please phone (02) 414 8330.

LEGEND TO GRAFEX SYMBOLS

. Propagation is possible but probably on less than 50% of the days of the month.

% Propagation is possible on between 50% and 90% of the days of the month.

'F' Propagation is possible by the First F modes on at least 90% of the days of the month.

'E' Propagation is possible by the E modes on at least 90% of the days of the month.

'M' Propagation is possible by both the First and Second F modes on 90% of the days of the month.

'S' Propagation is possible by the Second F mode on 90% of the days of the month.

'A' High absorption — above the ALF but probably too close to it for good HF communication.

'X' Complex mixture of modes including the Second E mode.

ADDRESS NO. 8303

DATE OCTOBER 1991

```
SYDNEY-JAPAN                    7825
27.0 MMMMMMMMMMMMMMF%%%.. FMMM
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-C&E.COAST USA           15712
27.0 F%.             ...      %FFFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-NORTH AFRICA            17109
27.0 .    .FFF%%%....          ....
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-ENGLAND LR              23031
27.0          ..              ..
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-CENTRAL EUROPE           13575
27.0       %%%%F%%%%%.
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST INDIES              18005
27.0 ...%%%%.                 ..
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-NEW ZEALAND               5255
27.0 ..........               ..
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST AFRICA LR           26220
27.0 FFFFF.  FF%%.....         %FF
   MHZ !    !    !    !    !
      00   06   12   18   24

ADELAIDE-P.N.G.                 2960
27.0 FFFFFFFFF%%%%....      .%FFF
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-MIDDLE EAST             12903
27.0   %FFFFFFF%%.....     .
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST COAST USA          11951
27.0 MMMMMFF%%..       ..%MMMMMM
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-PAPUA NEW GUINEA         2740
27.0 FFFFFFFF%%%%..... ..FFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST AFRICA LR          23596
27.0 FFFF%. .F%%%%%....%FFFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-SOUTH AFRICA              8315
27.0      %%%%%%%..
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-SOUTH AMERICA            14569
27.0 .....%%...%..            .
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-ENGLAND SR               14480
27.0        %%%%FF%%%%%..
   MHZ !    !    !    !    !
      00   06   12   18   24

MELBOURNE-P.N.G.                3157
27.0 FFFFFFFFF%%%%%.....FFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

BRISBANE-NEW ZEALAND            2506
27.0 %%%%.....                .%%%
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-CENTRAL EUROPE          16090
27.0       .%%%F%%%%....
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST INDIES             14950
27.0 FFFF%%%.      .          .%FFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-ENGLAND SR              16993
27.0        .%%%%%%%.....
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-JAPAN                     7923
27.0 MMMMMMMMMMMMMMMFFF%.. .%MM
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-C&E.COAST USA            18614
27.0 F%.              %....  .%FF
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-NORTH AFRICA             13941
27.0 ..    .FFFFFFF%%....      .
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST AFRICA SR           13804
27.0  .%%. .FF%%F%.
   MHZ !    !    !    !    !
      00   06   12   18   24

BRISBANE-P.N.G.                 2090
27.0 FFF%%%%%.........        .%%%F
   MHZ !    !    !    !    !
      00   06   12   18   24

ADELAIDE-NEW ZEALAND            3214
27.0 %%%%%%%%...              ...%
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-SOUTH AFRICA            11036
27.0    .M%%%%%.
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-SOUTH AMERICA           13180
27.0 %%%%%%%%%.               ...%%
   MHZ !    !    !    !    !
      00   06   12   18   24

SYDNEY-WEST AFRICA SR          16428
27.0 .....  .%..              ..
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-MIDDLE EAST              10077
27.0   %MMMMMMMMMFFF%%%..
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-WEST COAST USA           14743
27.0 FFFF%.              .     .%FF
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-PAPUA NEW GUINEA          4073
27.0 ..........               .
   MHZ !    !    !    !    !
      00   06   12   18   24

PERTH-ENGLAND LR               25544
27.0          %%.
   MHZ !    !    !    !    !
      00   06   12   18   24

HOBART-PAPUA NEW GUINEA         3711
27.0 FFFFFFFFF%%%%....        %FFFF
   MHZ !    !    !    !    !
      00   06   12   18   24

DARWIN-NEW ZEALAND              5321
27.0 %%%%%%%..                .%%%%
   MHZ !    !    !    !    !
      00   06   12   18   24
```

AUSTRALIAN UHF REPEATER LIST

NOTE: Corrections and updates may be sent to: CBA Repeater Listing, PO Box E160, St James, NSW 2000.

ACT

Canberra	2/32
Canberra	8/38

New South Wales

Albury	6/36
Armidale	4/34
Barraba	6/36
Bathurst	8/38
Bega	6/36
Belbora	1/31
Binya	3/33
Blue Mountains	2/32
Bombala	8/38
Booral	7/37
Bowral	6/36
Braidwood	
Brewarrina	1/31
Brindabella Ranges	7/37
Broken Hill	4/34
Broken Hill	7/37
Buladelah	7/37
Casino	6/36
Cobar	8/38
Coffs Harbour	6/36
Coolah	6/36
Cooma	4/34
Coonabarabran	4/34
Corowa	2/32
Corowa	5/35
Corwa	7/37
Deepwater	5/35
Deniliquin	1/31
Dungog	3/33
Eden	2/32
Glen Innes	7/37
Grafton	8/38
Grenfell	1/31
Gundagai	7/37
Gunnedah	2/32
Guyra	1/31
Warden	1/31
Hay	4/34
Inverell	2/32
Jindabyne	1/31
Junee	5/35
Lismore	2/32
Manilla	3/33
Monkey Hill	6/36
Mt Lambie	2/32
Murrirundi	3/33
Muswellbrook	4/34
Narrabri	2/32
Narranderra	8/38
Narromine	5/35
Narromine	6/36
Newcastle	1/31
Newcastle	2/32
Newcastle	5/35
Newcastle	6/36
Nundle	7/37
Orange	3/33
Port Macquarie	2/32
Sydney (south)	1/31
Sydney (west)	3/33
Sydney (outer-west)	4/34
Sydney (north)	7/37
Tamworth	4/34
Tenterfield	3/33
Tumbarumba	3/33
Tumut	6/36
Tweeds Heads	4/34
Wagga Wagga	1/31
Wagga Wagga	5/35
Walbundrie	2/32
Walcha	2/32
Walcha	6/36
Walcha	8/38
Warrumbungles	1/31
Wingham	1/31
Wilcannia	1/31
Wollongong	8/38
Northern Territory	
Bushy Park	1/31
Darwin	1/31
Erldunda Station	3/33
Katherine	2/32
Maryvale Station	4/34
Mt Swan	2/32

Queensland

Alpha	2/32
Atherton	8/38
Amiens	8/38
Ayr	3/33
Barcaldine Downs	1/31
Bathurst Heads	1/31
Bauhina Downs	4/34
Biloela	7/37
Blackall	8/38
Blackwater	6/36
Brisbane	1/31
Brisbane	5/35
Brisbane	7/37
Bundaberg	4/34
Bundaberg	7/37
Cairns	3/33
Chinchilla	8/38
Clermont	6/36
Clermont	7/37
Crows Nest	6/36
Dimbulah	6/36
Dirranbandi	8/38
Double Island Point	3/33
Edward River	3/33
Emerald	8/38
Gladstone	6/36
Gold Coast	3/33
Goondiwindi	4/34
Gympie	2/32
Gympie	5/35
Gympie	7/37
Hervey Bay	8/38
Hughenden	1/31
Ingham	2/32
Inglewood	1/31
Innisfail	1/31
Ipswich	4/34
Jericho	4/34
Kilcoy	3/33
Lakeland Downs	2/32
Longreach	3/33
Mackay	3/33
Mackay	6/36
Marlborough	2/32
Maryborough	6/36
Maxwelton	2/32
Miles	6/36
Monto	3/33
Moranbah	4/34
Moura	1/31
Mt Isa	1/31
Mundubbera	6/36
Murgon	7/37
Quilpie	2/32
Rockhampton	1/31
Rockhampton	4/34
Roma	1/31
Springsure	3/33
Sunshine Coast	6/36
Sunshine Coast	8/38
Tambo	6/36
Taroom	2/32
Thargomindah	6/36
Toowoomba	2/32
Toowoomba	4/34
Townsville	1/31
Townsville	4/34
Wavell Heights	2/32
Warwick	1/31
Wide Bay	1/31
Yaraka	7/37

South Australia

Adelaide	1/31
Adelaide	3/33
Adelaide	5/35
Angaston	4/34
Blinman	3/33
Carrietown	1/31
Ceduna	1/31
Clare	7/37
Cleve	2/32
Coonalpyn	6/36
Coppudurba Hill	1/31
Hawker	7/37
Kangaroo Island	4/34
Manum	8/38
Mt Bryan	8/38
Mt Gambier	5/35
Mt Gambier	7/37
Myponga	2/32
Naracoorte	4/34
Orroroo	2/32
Port Lincoln	8/38
Port Pirie	4/34
Renmark	6/36
Snowtown	6/36
Tarcoola	6/36
Wilkatana	8/38
Yorketown	7/37

Tasmania

Burnie	8/38
Central Highlands	7/37
Devonport	1/31
East Coast	6/36
Flinders Island	1/31
Hobart	1/31
Hobart	5/35
Launceston	2/32
Launceston	6/36
Midlands	4/34
North East Coast	3/33
North West Coast	4/34
North West Coast	6/36
West Coast	2/32

Victoria

Alexandra	1/31
Ballarat	2/32
Ballarat	5/35
Bairnsdale	7/37
Beech Forest	3/33
Bendigo	4/34
Cavendish	8/38
Currajung	4/34
Echuca	6/36
Euroa	3/33
Falls Creek	3/33
Foster	6/36
Geelong	4/34
Halls Gap	6/36
Hamilton	5/35
Harcourt	8/38
Hawkesdale	4/34
Horsham	3/33
Kerang	2/32
Lavington	4/34
Mansfield	2/32
Melbourne (north)	1/31
Melbourne (metro)	3/33
Melbourne (metro)	5/35
Melbourne (south)	7/37
Mildura	3/33
Moe	2/32
Mornington Pen.	8/38
Mortlake	7/37
Mt Cann	8/38
Mt Concord	6/36
Mt Delegate	3/33
Mt Terrible	8/38
Myrtleford	8/38
Penshurst	1/31
Shepparton	7/37
St Arnaud	1/31
Swifts Creek	1/31
Talangatta	7/37
Wangarrata	6/36
Waubra	7/37

West Australia

Albany	3/33
Augusta	7/37
Bencubin	2/32
Boyup Brook	4/34
Bunbury	2/32
Carnamah	2/32
Carnarvon	2/32
Coolgardie	7/37
Darkin	6/36
Denmark	1/31
Esperance	4/34
Kalgoorlie	2/32
Kambalda	1/31
Katanning	1/31
Kellerberrin	1/31
Kulin	4/34
Lancelin	4/34
Mandurah	7/37
Manjimup	6/36
Margaret River	6/36
Meekatharra	1/31
Merredin	2/32
Mia Mia	1/31
Mt Manypeaks	6/36
Mt Barker	5/35
Mt Barrow	7/37
Mt Saddleback	1/31
Mt Solus	4/34
Nannup	2/32
Perth	1/31
Perth	3/33
Perth	5/35
Perth	8/38
Ravensthorpe	8/38
Stirling Ranges	7/37
Wickham	1/31
Wongan Hills	8/38
Wyalkatchem	6/36
York	7/37

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